TOWN OF ELIZABETH
BOARD OF TRUSTEES REGULAR MEETING
Tuesday, March 28, 2023 at 7:00 PM
Town Hall, 151 S. Banner Street

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

UNSCHEDULED PUBLIC COMMENT

AGENDA CHANGES

CONSENT AGENDA

1. Minutes of the Regular Meeting of March 14, 2023, at 7:00 p.m.

PUBLIC HEARING

2. Dads of Elbert County Special Event Liquor License application – Michelle Oeser

NEW BUSINESS

3. Discussion and possible action on the approval of the Special Event Liquor License for the Dads of Elbert County – Michelle Oeser

PUBLIC HEARING

4. Town of Elizabeth Special Event Liquor License application – Michelle Oeser

NEW BUSINESS

5. Discussion and possible action on the approval of the Special Event Liquor License for the Town of Elizabeth – Michelle Oeser

PRESENTATIONS

6. Angie Bedolla – CORE Electric

NEW BUSINESS

7. Discussion and possible action on Resolution 23R15, a Resolution adopting the Elbert County Hazard Mitigation Plan (2023 Update) - Patrick Davidson

MANAGEMENT MONITORING REPORTS

8. Management Monitoring Reports

BOARD OF TRUSTEES REPORTS

9. Board reports

STUDENT LIAISON REPORT

10. Student Liaison report – Karli Pronske

MINUTES

11. Minutes of the Main Street Board of Directors Meeting of February 13, 2023
12. Minutes of the Planning Commission Special Meeting of March 7, 2023

EXECUTIVE SESSION

13. To determine positions relative to matters that may be subject to negotiations, develop a strategy for negotiations, and/or instruct negotiators, pursuant to C.R.S. § 24-6-402 (4)(e), for the possible purchase of lands adjacent to the Town of Elizabeth, and to discuss a potential trade of lands for the benefit of the Town.

ADJOURNMENT

MEETING PROTOCOL AND STANDARDS OF CONDUCT

Public Participation

Public comment is encouraged and will be listed as an agenda item at every regular Board meeting.

Each individual wishing to be heard during the public comment period will be given up to three (3) minutes to make a comment.

The public comment period will not be used to make political endorsements or for political campaign purposes.

Questions from the Board will be for clarification purposes only. Public comment will not be used as a time for problem solving or reacting to comments made but, rather, for listening to the comments of citizens without taking any formal action.

The Board may direct the Town Administrator to provide information requested by a speaker during the public comment period.

Speakers are not allowed to make belligerent, accusatory, impertinent, slanderous, threatening, abusive, or disparaging comments.

The Mayor may elect to defer public comment on a specific issue that appears on the regular agenda until that specific item is addressed.

The Mayor may call for order when sidebar conversations occur in the audience. Those conversations are distracting from the Board addressing the topics at hand.

Members of the public who do not follow proper conduct after a warning in a public meeting may be barred from further participation at that meeting or removed from the Board Chambers pursuant to the Elizabeth Municipal Code and Colorado Revised Statutes.

Board of Trustees – Record of Proceedings

March 14, 2023

CALL TO ORDER
The Regular Meeting of the Board of Trustees of the Town of Elizabeth was called to order on Tuesday, March 14, 2023, at 7:00 p.m. by Mayor Nick Snively.

ROLL CALL
Present were Mayor Nick Snively, Mayor Pro Tem Linda Secrist, and Trustees Loren Einspahr, Tammy Payne, Angela Ternus, Barb McGinn, and Joe Belongia. There was a quorum to do business.

Also present were Town Administrator Patrick Davidson, Town Clerk Michelle Oeser, Community Development Director Zach Higgins, Interim Police Chief Jeff Engel, Public Works Director Mike DeVol, Assistant Public Works Director James McErnie, Town Attorney Corey Hoffmann, and Student Liaison Karli Pronske.

PLEDGE OF ALLEGIANCE
Mayor Snively led the Board in the Pledge of Allegiance.

PUBLIC STATEMENT

1. Trustee Angela Ternus

UNSCHEDULED PUBLIC COMMENT
Connie Lehman – Town of Elizabeth resident.

AGENDA CHANGES
No agenda changes from the Administration.

No agenda changes from the Board.

Agenda set.

CONSENT AGENDA

2. Minutes of the Regular Meeting of February 28, 2023, at 7:00 p.m.
3. Minutes from the Special Meeting of March 8, 2023, at 6:00 p.m.
4. Introduce new Public Works Employee, Nick Setyan

Motion by Trustee McGinn, seconded by Trustee Payne, to accept the Consent Agenda as presented.
The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

NEW BUSINESS

5. Discussion and Possible Action regarding appointment of Carrie Wedel to the Main Street Board of Directors for a three-year term through March 31, 2026

Motion by Mayor Pro Tem Secrist, seconded by Trustee Einspahr, to approve the appointment of Carrie Wedel to the Main Street Board of Directors for a three-year term through March 31, 2026.
The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

6. Discussion and possible approval of the transfer of ownership from Buzzards Pizza to Jac's Inc.

Motion by Trustee Einspahr, seconded by Mayor Pro Tem Secrist, to approve the transfer of ownership from Buzzards Pizza to Jac's Inc.
The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

OLD BUSINESS

7. Discussion and possible action on Resolution 23R13, a Resolution adopting a revised schedule for Land Use Development Fees

Motion by Trustee Payne, seconded by Trustee Einspahr, to approve Resolution 23R13, a Resolution adopting a revised schedule for Land Use Development Fees.
The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

Mayor Snively closed the Regular Meeting and entered the Public Hearing at 7:23 p.m.

PUBLIC HEARING

8. 701 S Elizabeth Street – Pine Ridge Crossing Site Plan Amendment

Community Development Director Zach Higgins gave a staff report. CJ Kirst, Tahoe Consulting, LLC gave a presentation on the proposed amendment to the project.

Mayor Snively opened the Public Hearing to public comment. Public comments were made by the following individuals:
Rachel White – Town of Elizabeth resident provided written comment
Marc Dettenrieder – Town of Castle Rock resident
Steve Tapp – Town of Elizabeth resident
Patsy Moore Weskamp –Elbert County resident
Paul Schwarzkopf- Town of Elizabeth resident
Tom Thornton – Town of Elizabeth resident
Dave Turley – Town of Elizabeth resident

Mayor Snively closed the Public Hearing at 8:03 p.m.

NEW BUSINESS

9. Discussion and possible action for approval regarding 701 S Elizabeth Street – Pine Ridge Crossing Site Plan Amendment

Motion by Trustee Payne, seconded by Trustee Einspahr, to approve the Pine Ridge Crossing Site Plan Amendment for 701 S Elizabeth Street.
A roll call vote was taken. The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

Mayor Snively closed the Regular Meeting and entered the Public Hearing at 8:31 p.m.

PUBLIC HEARING

10. SE corner of Walnut Street and S Elbert Street - Walnut Grove Sketch Plan

Mr. Higgins gave a staff report. Otto Burden gave a presentation on the Walnut Grove Sketch Plan.

Mayor Snively opened the Public Hearing to public comment. Public comments were made by the following individuals:
Steve Tapp- Town of Elizabeth resident
Tom Thorton – Town of Elizabeth resident
Paul Schwarzkopf – Town of Elizabeth resident
Dave Turley- Town of Elizabeth resident

Mayor Snively closed the Public Hearing at 8:58p.m.

NEW BUSINESS

11. Discussion and possible action for approval regarding SE corner of E Walnut St and S Elbert St - Walnut Grove Sketch Plan

Motion by Trustee Einspahr, seconded by Trustee Payne, to approve the Sketch Pan for the Walnut Grove Development.
A roll call vote was taken. The vote of those Trustees present was 7 in favor and 0 opposed. Motion passed unanimously.

MANAGEMENT MONITORING REPORTS

- Public Works Director Mike DeVol updated the Board on the two new trucks purchased for Public Works.
- Mr. DeVol informed the Board that a job offer has been made to a potential employee.
- Trustee Einspahr told Mr. DeVol that the fencing around the new well house looks awesome.
- Assistant Public Works Director James McErnie told the Board that progress is being made on the houses across the street.
- Mr. McErnie updated the Board on preparations for spring.
- Mr. McErnie stated that progress is being made on the fencing at Running Creek Park.
- Community Development Director Zach Higgins and the Board discussed dates and times for a joint meeting between the Board of Trustees and the Main Street Board of Directors.
- Mr. Higgins told the Board that the Main Street Board of Directors is looking at the possibility of creating a gateway sign for Highway 86 and Main Street.
- Interim Police Chief Jeff Engel told the Board he is currently looking at efficiencies and feasibility, as well as communications within the department.
- Interim Police Chief Jeff Engel provided the Board an update on Officer Training.
- Interim Chief Engel told the Board that Staff will be meeting to discuss and set up training needs for the rest of 2023.
- Interim Chief Engel let the Board know they are working on retooling critical policies.
- Interim Chief Engel and the Police Staff are having a planning session to discuss and plan for summer events.
- Trustee Ternus asked if a report containing police statistics can be included in the Board packet.
- Town resident Steve Tapp requested more police patrolling on Elbert Street.

- Town Administrator Patrick Davidson updated the Board regarding the Post Office.
- Town Attorney Corey Hoffmann updated the Board on the status of the lawsuit filed against the Town in March of 2020.
- Mayor Snively asked Mr. Hoffmann if there were any updates on the legislation discussed at the last meeting.
- Town Clerk Michelle Oeser gave an update regarding where we are in the movie night plans.
- Ms. Oeser updated the Board on the status of sponsorship requests.

BOARD OF TRUSTEE REPORTS

- Trustee Ternus told the Board that she had recently observed Town Court and stated she felt others would enjoy it.
- Trustee Ternus asked about the status of medallions for street signs.
- Discussion on missing letters on the Town sign located on the east side of Town.
- Discussion regarding the guardrails on Highway 86 coming out of Crossroads Circle.

STUDENT LIAISON REPORT

- Student Liaison Karli Pronske discussed her written report.
- Ms. Pronske let the Board know that the Senior Sneak, luncheon, prom, and graduation are coming fast.
- Trustee Ternus told Ms. Pronske that she appreciated her comments during the land use application portion of the meeting.

MINUTES

15. Minutes of the Historic Advisory Board Meeting of February 6, 2023
16. Minutes of the Planning Commission Meeting of February 12, 2022

EXECUTIVE SESSION

Motion by Mayor Snively, seconded by Trustee Einspahr, to adjourn the regular meeting at 10:04 p.m. and enter an executive session "To hold a conference with the Town's attorney to receive legal advice on specific legal questions, pursuant to C.R.S. 24-6-402(4)(b) regarding the Elizabeth Police Department.
The vote of those Trustees present was unanimously in favor. Motion carried.

Motion by Mayor Pro Tem Secrist, seconded by Trustee McGinn, to adjourn the executive session, and return to the regular meeting at 10:59 p.m.
The vote of those Trustees present was unanimously in favor. Motion carried.

ADJOURNMENT

Motion by Trustee Einspahr, seconded by Mayor Pro Tem Secrist, to adjourn the meeting at 11:00 p.m.

The vote of those Trustees present was unanimously in favor. Motion carried.

_____ _____

Town Clerk Michelle Oeser Mayor Nick Snively

TO: Honorable Mayor and Board of Trustees
FROM: Michelle M. Oeser, Town Clerk
DATE: March 28, 2023
SUBJECT: Dads of Elbert County Special Event Liquor License Application

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SUMMARY

On March 13, 2023, the Dads of Elbert County applied for a Special Event Liquor License for the 3rd Annual Meat In Event. Posting has been provided at 366 Grant Street.
Justin Hundley will be the event manager for the Meat In Event. Both Mr. Hundley and Mr. Decker will be present at the Board meeting to answer any questions the Board has.
The map that is included depicts where the licensed area is located and the general mapping for the event.

The Elizabeth Police Department does not have any issues that would affect approval of this license application.

STAFF RECOMMENDATION

Staff recommends approval of the Dads of Elbert County Special Event License.

ATTACHMENTS

Special Event Application

Town of Elizabeth

Application for a Special Events Permit

Departmental Use Only

RECEIVED

MAR 13 2023

Town of Elizabeth

In order to qualify for a Special Events Permit, You Must Be a Qualifying Organization Per 44-5-102 C.R.S. and One of the Following (See back for details.)

- [X] Social
- [ ] Fraternal
- [ ] Patriotic
- [ ] Political
- [ ] Athletic
- [ ] Chartered Branch, Lodge or Chapter
- [ ] National Organization or Society
- [ ] Religious Institution
- [ ] Philanthropic Institution
- [ ] Political Candidate
- [ ] Municipality Owned Arts Facilities

LIAB — Type of Special Event Applicant is Applying for:

- 2110 [ ] Malt, Vinous And Spirituous Liquor — $25.00 Per Day
- 2170 [X] Fermented Malt Beverage — $10.00 Per Day

DO NOT WRITE IN THIS SPACE

Liquor Permit Number

1. Name of Applicant Organization or Political Candidate: Dads of Elbert County

State Sales Tax Number (Required): [redacted]

2. Mailing Address of Organization or Political Candidate (include street, city/town and ZIP): [redacted]

3. Address of Place to Have Special Event (include street, city/town and ZIP): 366 Grant St. Elizabeth, CO. 80107

4. Authorized Representative of Qualifying Organization or Political Candidate: Clint Decker [redacted]

Authorized Representative's Mailing Address (if different than address provided in Question 2.) [redacted]

5. Event Manager: JUSTIN HUNDLEY — Date of Birth [redacted] — Phone Number [redacted]

Event Manager Home Address (Street, City, State, ZIP) [redacted] — JUSTIN@ELIZABETHLOCKER.COM

6. Has Applicant Organization or Political Candidate been Issued a Special Event Permit this Calendar Year?
[X] No [ ] Yes How many days? _____

7. Is the premises for which your event is to be held currently licensed under the Colorado Liquor or Beer codes?
[X] No [ ] Yes License Number _____

8. Does the Applicant Have Possession or Written Permission for the Use of The Premises to be Licensed? [ ] Yes [ ] No

List Below the Exact Date(s) for Which Application is Being Made for Permit

Date 4/29/2023 Hours From 12:00 p.m. To 6:00 p.m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.
Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.
Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.

Oath of Applicant

I declare under penalty of perjury in the second degree that I have read the foregoing application and all attachments thereto, and that all information therein is true, correct, and complete to the best of my knowledge.

Signature	Title	Date
[signature]	President	3/13/23

Report and Approval of Local Licensing Authority (City or County)

The foregoing application has been examined and the premises, business conducted and character of the applicant is satisfactory, and we do report that such permit, if granted, will comply with the provisions of Title 44, Article 5, C.R.S., as amended.

THEREFORE, THIS APPLICATION IS APPROVED.

Local Licensing Authority (City or County)		Telephone Number of City/County Clerk
	[ ] City [ ] County	

Signature	Title	Date

DO NOT WRITE IN THIS SPACE - FOR DEPARTMENT OF REVENUE USE ONLY

Liability Information

License Account Number	Liability Date	State	Total
		-750 (999)	$.

(Instructions on Reverse Side)

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

Dads of Elbert County

is a

Nonprofit Corporation

formed or registered on 04/01/2021 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 20211328011 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 03/13/2023 that have been posted, and by documents delivered to this office electronically through 03/14/2023 @ 18:08:48 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 03/14/2023 @ 18:08:48 in accordance with applicable law. This certificate is assigned Confirmation Number 14781259 .

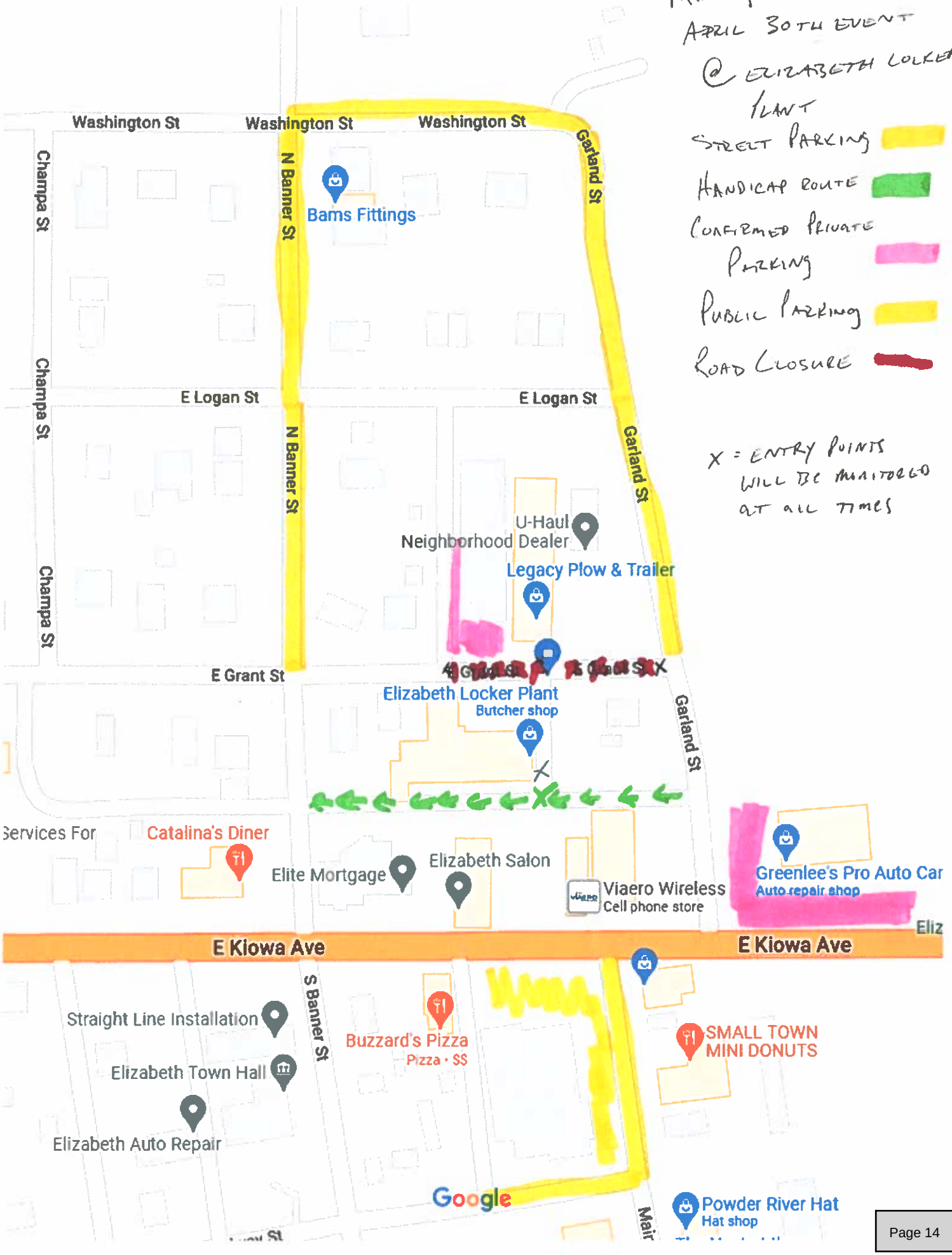
Jena Griswold

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's website is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's website, https://www.coloradosos.gov/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our website, https://www.coloradosos.gov click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."


ENTRY
I.D. CHECK
E Grant St
E Grant St
E Grant St
E Grant St
E Grant St
SMOKER
FOOD
TENT
GRILL
PRIMETER
FENCE
Garland St
Garland St
Garland St
185
Elizabeth Locker Plant
Butcher shop
ENTRY
I.D. CHECK
Elizabeth Florist
Wire Services
Florist
Google
Viaero Wireless


PARKING FOR
APRIL 30TH EVENT
@ ELIZABETH LOCKER
PLANT
STREET PARKING
HANDICAP ROUTE
CONFIRMED PRIVATE
PARKING
PUBLIC PARKING
ROAD CLOSURE
X = ENTRY POINTS
WILL BE MANNED
AT ALL TIMES
Washington St
Washington St
Washington St
Champa St
Champa St
Champa St
N Banner St
N Banner St
Garland St
Garland St
Garland St
E Logan St
E Logan St
E Grant St
Bams Fittings
U-Haul
Neighborhood Dealer
Legacy Plow & Trailer
Elizabeth Locker Plant
Butcher shop
Services For
Catalina's Diner
Elite Mortgage
Elizabeth Salon
Viaero Wireless
Cell phone store
Greenlee's Pro Auto Car
Auto repair shop
E Kiowa Ave
E Kiowa Ave
S Banner St
Straight Line Installation
Elizabeth Town Hall
Elizabeth Auto Repair
Buzzard's Pizza
Pizza · $$
SMALL TOWN
MINI DONUTS
Google
Powder River Hat
Hat shop

ELIZABETH
EST. 1944 LOCKER PLANT

Michael D. Hundley
President

Justin N. Hundley
Vice-President

Elizabeth, Co 80107-0160
Phone (303) 646-4020 Fax (303) 688-2240

This letter is to confirm that the Elizabeth Locker Plant has given Dad's of Elbert County (DOEC) permission to use the property located at 366 Grant St. in Elizabeth, CO. for an event on April 29th 2023. The event is a fundraising event for the local community. We understand that there will be alcohol on the premises under controlled conditions. This event will take place from 12:00pm and end at 5:00pm with allotted time to setup and cleanup after. If there are any questions please feel free to contact Justin Hundley V.P. of Elizabeth Locker Plant.

Respectfully,

Justin Hundley
Vice President
303-324-8591 C
303-646-4020 O

TO: Honorable Mayor and Board of Trustees
FROM: Michelle M. Oeser, Town Clerk
DATE: March 28, 2023
SUBJECT: Town of Elizabeth Friday Night Markets Special Event Liquor License

SUMMARY

On February 16, 2023, the Town of Elizabeth applied for a Special Event Liquor License for the Town's Summer Friday Night Market series. Posting has been provided at Running Creek Park. Brendan Kloser will be the event manager for the Friday Night Markets'. Mr. Kloser will be present at the Board meeting to answer any questions the Board has.
The map that is included depicts where the stage, serving areas and check point gates will be located for the event.

The Elizabeth Police Department does not have any issues that would affect approval of this license application.

STAFF RECOMMENDATION

Staff recommends approval of the Town of Elizabeth's Friday Night Market Special Event License application.

ATTACHMENTS

Special Event Application

Application for a Special Events Permit

Town of Elizabeth

Departmental Use Only

RECEIVED

FEB 16 2023

Town of Elizabeth

In order to qualify for a Special Events Permit, You **Must Be a Qualifying Organization Per 44-5-102 C.R.S. and One of the Following** (See back for details.)

- ☐ Social
- ☐ Fraternal
- ☐ Patriotic
- ☐ Political
- ☐ Athletic
- ☐ Chartered Branch, Lodge or Chapter
- ☐ National Organization or Society
- ☐ Religious Institution
- ☐ Philanthropic Institution
- ☐ Political Candidate
- ☑ Municipality Owned Arts Facilities

LIAB	Type of Special Event Applicant Is Applying for:	
2110	☑ Malt, Vinous And Spirituous Liquor	$100.00 Per Application
2170	☐ Fermented Malt Beverage	$100.00 Per Application

DO NOT WRITE IN THIS SPACE

Liquor Permit Number

1. Name of Applicant Organization or Political Candidate: Town of Elizabeth

State Sales Tax Number (Required): N/A

2. Mailing Address of Organization or Political Candidate (include street, city/town and ZIP)
PO Box 159
Elizabeth, Co. 80107

3. Address of Place to Have Special Event (include street, city/town and ZIP)
500 E. Kiowa Ave.
Elizabeth, Co. 80107

4. Authorized Representative of Qualifying Organization or Political Candidate: Patrick Davidson

Date of Birth: [redacted]

Phone Number: [redacted]

Authorized Representative's Mailing Address (if different than address provided in Question 2.): [redacted]

5. Event Manager: Brendan Kloser

Date of Birth: [redacted]

Phone Number: [redacted]

Event Manager Home Address (Street, City, State, ZIP): [redacted]

Email Address of Event Manager: [redacted]

☐ Issued a Special Event Permit this Calendar Year?
☐ No ☐ Yes How many days? _____

☐ Under the Colorado [redacted]
☐ No ☐ Yes License Number ☐ _____

8. Does the Applicant Have Possession or Written Permission for the Use of The Premises to be Licensed? Yes No

List Below the Exact Date(s) for Which Application is Being Made for Permit

Date June 9, 2023 Hours From 2 p.m. To 11 p.m.	Date June 16, 2023 Hours From 2 p.m. To 11 p.m.	Date June 23, 2023 Hours From 2 p.m. To 11 p.m.	Date June 30, 2023 Hours From 2 p.m. To 11 p.m.	Date July 7, 2023 Hours From 2 p.m. To 11 p.m.
Date July 14, 2023 Hours From 2 p.m. To 11 p.m.	Date July 21, 2023 Hours From 2 p.m. To 11 p.m.	Date Aug. 4, 2023 Hours From 2 p.m. To 11 p.m.	Date Aug. 11, 2023 Hours From 2 p.m. To 11 p.m.	Date Aug. 18, 2023 Hours From 2 p.m. To 11 p.m.
Date July 28, 2023 Hours From 2 p.m. To 11 p.m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.	Date Hours From .m. To .m.

Oath of Applicant

I declare under penalty of perjury in the second degree that I have read the foregoing application and all attachments thereto, and that all information therein is true, correct, and complete to the best of my knowledge.

Signature	Title	Date
[signature]	TOWN ADMINISTRATOR	2/16/2023

Report and Approval of Local Licensing Authority (City or County)

The foregoing application has been examined and the premises, business conducted and character of the applicant is satisfactory, and we do report that such permit, if granted, will comply with the provisions of Title 44, Article 5, C.R.S., as amended.

THEREFORE, THIS APPLICATION IS APPROVED.

Local Licensing Authority (City or County)	☐ City ☐ County	Telephone Number of City/County Clerk

Signature	Title	Date

DO NOT WRITE IN THIS SPACE - FOR DEPARTMENT OF REVENUE USE ONLY

Liability Information

License Account Number	Liability Date	State	Total
			$

(Instructions on Reverse Side)


GATE
Porta Potty
Sanatize Unit
GATE
500 E Kiowa Ave
Electrical Panel
EBC
Electrical Panel
GATE
Porta Potty
ADA Porta Potty
Sanitize Unit
STAGE
Electric Panel
Google Earth
200 ft
N

TO: Honorable Mayor, Mayor Pro Tem, and Board of Trustees
FROM: Patrick Davidson, Town Administrator
DATED: March 28, 2023
SUBJECT: FEMA – Elbert County Hazard Mitigation Plan

BACKGROUND

Elbert County is engaged in the preparation and updating of its FEMA Hazard Mitigation Plan on a five (5) year rotation. This process allows municipalities and agencies [for example Fire Districts] to participate in the plan as well. Previously the Town of Elizabeth adopted the 2017 Plan. This action item, through Resolution, anticipates the Town's adoption of the 2023 Elbert County Hazard Mitigation Plan.

To assist in the development and revision to the existing plan, Elbert County retained the services of Synergy Disaster Recovery to assist in information gathering, public meetings, policy review and expansion of the current Plan. The "kickoff" for this project began on May 26, 2022. From that date, a series of additional workshops and meetings were held on July 27, 2022, August 9, 2022, October 5, 2022, and October 13, 2022. Between each meeting, information was sought and compiled by Synergy Disaster Recovery to assist in development of the 2023 Plan. In total, the time spent by the Town of Elizabeth Staff in this matter exceeded 40 hours.

On November 28, 2022 the FEMA mandated public review and comment period was opened for community input. Comments and concerns were raised through the deadline of December 9, 2022. On February 7, 2022, notice was provided that all suggested revisions to the 2023 Plan were under review by the Colorado Department of Homeland Security Emergency Management and FEMA. The final step of review is called a FEMA "Approval Pending Adoption". The adoption is the step required by this Board of Trustees, the Board of Commissioners, and any other agencies seeking to be registered with the Plan. For purposes of the Town of Elizabeth, the final step is the approval being sought through Resolution.

It should be noted that the overall purpose for the Mitigation Plan is to assist elected officials and agency staff to evaluate concerns within the specific community and to allow for future planning. In the event of a natural disaster, the existence of a Mitigation Plan is taken into consideration when seeking FEMA Disaster Funding and Designation. As such, the adoption of the Plan is important in the event of a disaster, and FEMAs willingness and ability to respond to the same.

ANALYSIS

The Elbert County Hazard Mitigation Plan is a lengthy document for which it is difficult to summarize in this short Memorandum. However, the following were overall considered "High

Risk Hazards" within the County: drought, flood, public health hazards, severe weather (hail, lightening, windstorms), severe winter weather, and wildfire. "Moderate Risk Hazards" included cyber hazards (impactful to local governments), dam/levee incidents (tied to area severe weather), earthquake, extreme heat, hazardous materials release, and tornados. No factors were included that would be defined as "Low Risk Hazards".

Due to the geographic size of the County, the relatively small areas of residential density, and the low population in the County, the following mitigation goals and objectives were identified:

1. Improve education and awareness of hazards and risk reduction measures.

2. Protect and reduce the impacts to lifeline, critical facilities, infrastructure, and other community assets from hazards.

3. Incorporate hazard mitigation into future development and redevelopment plans and policies.

4. Enhance local mitigation capabilities, including human, technical, financial, and regulatory capabilities.

5. Improve communication and coordination of mitigation activities between state and local governments and with private and non-profit organizations.

Specific to the Town of Elizabeth, the following were identified as appropriate Hazard Mitigation Actions for the 2023 Plan.

1. Emergency Preparedness Education – provide education on hazards and preparedness and supplies such as NOAA radios, 72-hour kits, go bags, and best practices for documents.

2. Public and Private Tree Maintenance – trimming and removal of dead and damaged trees in and around Elizabeth.

3. Emergency Notification / Siren System – install a siren/PA system to convey information, notify residents to review media sources/email, and deliver orders for public safety.

4. Town of Elizabeth Evacuation Plan – develop evacuation plan to create resident awareness of routs and is integrated with the actions for education and emergency notifications.

5. Storm Water Planning - monitor the current process as development continues to minimize damages caused by severe weather and flood events.

STAFF RECOMMENDATION

Staff recommends the Board adopt the Elbert County Hazard Mitigation Plan for the reasons set forth herein.

BUDGET CONSIDERATIONS

The adoption of the Elbert County Hazard Mitigation Plan has no immediate budget or financial considerations. The implementation of some of the above-mentioned actions could have financial considerations moving forward. There is, however, no specific mandate that these items be completed during the time this plan is implemented in 2023 or revised in 2028.

ATTACHMENTS

Resolution Adopting the Elbert County Hazard Mitigation Plan 2023 (Update)
Hazard Mitigation Plan

RESOLUTION 23R15

A RESOLUTION ADOPTING THE ELBERT COUNTY HAZARD MITIGATION PLAN (2023 UPDATE)

WHEREAS, the Town of Elizabeth, with the assistance from Synergy Disaster Recovery, has gathered information and prepared the Elbert County Hazard Mitigation Plan (2023) Update; and

WHEREAS, the Elbert County Hazard Mitigation Plan (2023) Update has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Elizabeth is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town of Elizabeth has reviewed the Plan and affirms that the Plan will be updated no less than every five (5) years.

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF ELIZABETH, COLORADO AS FOLLOWS:

1. The Town of Elizabeth hereby adopts the Elbert County Hazard Mitigation Plan (2023) Update, as this jurisdiction's Multi-Hazard Mitigation Plan and resolves to execute the actions in the Plan. The Plan is hereby attached as **Exhibit A**.

PASSED, APPROVED, and ADOPTED this 28th day of March 2023, by the Board of Trustees of the Town of Elizabeth, Colorado, on first and final reading, by a vote of _____ for and _____ against.

_____
Nick Snively, Mayor

ATTEST:

_____
Michelle M. Oeser, Town Clerk



Elbert County
Hazard Mitigation Plan
2023 Update

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Professional planning services for this plan update provided by:



EXECUTIVE SUMMARY

The Disaster Mitigation Act (DMA) is federal legislation that requires proactive, pre-disaster hazard mitigation planning as a prerequisite for some funding available under the Robert T. Stafford Act. The DMA encourages state and local authorities to work together on pre-disaster planning. The planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

Hazard mitigation is the use of long- and short-term strategies to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves strategies such as planning, policy changes, programs, projects, and other actions that can mitigate the impacts of hazards. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact an area, but with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that disasters can cause. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

Elbert County and a partnership of local governments and organizations within the county have developed and maintained a hazard mitigation plan (HMP) to reduce risks from natural disasters and to comply with the DMA. This 2022 plan update builds upon the community's previous efforts and identifies the mitigation strategy that Elbert County and its municipalities will follow over the next five years.

Hazard Mitigation is a sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

HAZARDS OVERVIEW

A brief overview of the hazards profiled in this 2023 Elbert County Hazard Mitigation Plan (HMP) is provided below. In addition to those hazards profiled in the 2017 HMP, the hazard mitigation planning committee (HMPC) decided to add the hazards of Cyber Hazards, Extreme Heat, Hazardous Materials Release, and Public Health Hazards to this updated HMP. Also included below is the relative hazard risk ranking for each hazard, as determined by the HMPC.

High Risk Hazards:

Drought – Frequent with greatly varied severity since 2000. There have been multiple periods of extreme drought, including an almost year long period when 100% of the county was affected. Multiple exceptional drought periods have occurred, impacting approximately 10% - 15% of the county.

Flood – Significant history of flooding and flash flooding events in Elbert County. There is the potential for extensive building damage and losses, as well as economic impacts to multiple areas in the county. Agricultural structures and parcels are the majority of buildings and property exposed to flooding.

Public Health Hazards – Impacted by a number of factors. Water quality issues can quickly affect the entire population and drought has been shown to increase the concentration of undesirable metals in water sources. Air quality may be a concern due to potential dust from drought affected areas and wildfire smoke. Mental health should be a commonly supported concept across organizations. Epidemic and pandemic will continue to be a risk for the foreseeable future.

Severe Weather (Hail, Lightning, Windstorm) – Thunderstorms are a frequent occurrence and present multiple risks to people and property. There has been great variance in size of hailstones and wind speeds, both of which have done considerable damage in the county. One lightning death occurred in 1988.

Severe Winter Weather – The effects of severe winter weather are wide-reaching and dangerous. Each year preparation for severe events is a concern. The county has seen large amounts of damages to property and crops, as well as events that halted day-to-day operations, due to extreme cold and excessive amounts of snow. Those at risk of isolation or having an inability to handle the effects of an event are a priority, as they are at greater risk of effects.

Wildfire – Elbert County has had a minimal number of fires, all 1,000 acres or less. However, wildfire is one of the most concerning hazards for the county, as wildfire is a risk to most areas. Wildfire season is becoming longer in duration and fires increase in size more rapidly. While Elbert County has had small fires, the potential rate of spread risk across the county is very high to extreme.

Moderate Risk Hazards:

Cyber Hazards – Increasingly more common for local governments, private infrastructure organizations, hospitals, and other important operational entities to be targeted. Ransomware, overriding control of critical processes, and other evolving threats are impacting safety and security. No known cyber attacks in the county to date.

Dam / Levee Incident – All of the 82 jurisdictional dams listed by the Colorado Division of Water Resources Dam Safety Branch, (listed as 72 jurisdictional dams by the National Inventory of Dams), are classified as low hazard or no public hazard (NPH). There is a single levee and no known dam or levee incident occurrences.

Earthquake – Historical 3.0 magnitude event in 1966. Low probability of a large magnitude earthquake occurring. If there is an event, would likely have a low magnitude.

Extreme Heat – History shows a high of 24 events in 2011. Extreme heat events are a minimum duration of 2 consecutive days with temperatures over 90°, between the months of May and September. Between 1979 to 2019, a total of 181 extreme heat events occurred, with varying numbers of days for each event.

Hazardous Materials Release – Hazardous materials present a risk to the public, as there are 17 fixed storage facilities and a designated transport route, on I-70, in the county. While there have been very few incidents reported, the amount of hazardous materials being handled or transported presents a notable risk. Responder and public education are a priority for preparedness should an incident occur.

Tornado – Tornadoes are infrequent but have occurred multiple times in the county. The largest tornado rating that has been recorded was an F2/EF2. Some damages have been reported for tornado events; however, for the majority of events, no damages were recorded.

No hazards ranked Low Risk by the HMPC.

1 MITIGATION STRATEGY

1.1 Mitigation Goals and Objectives

The hazard mitigation planning committee (HMPC) reviewed the mission statement and mitigation goals for the 2017 Plan. During discussion, the HMPC decided to update the mitigation goals to include the topics of Lifelines impacts and redevelopment planning. Also, during discussion, it was decided the goals would benefit from the addition of objectives which will provide direction toward achieving success in mitigation implementation. These goals and objectives are below, as well as Elbert County's mission guiding the mitigation strategy. Human-caused hazards were added to the mission to reflect the hazards of concern for the county.

Mission Statement: Reduce Risk to the People, Property, and Environment of Elbert County from the Impacts of Natural & Human-caused Hazards

Mitigation Goals & Objectives:

1. Improve education and awareness of hazards and risk reduction measures
    - Create engagement opportunities to educate the public, community leaders, and jurisdictions on hazard risk and mitigation goals.
    - Continue to develop and expand programs for community preparedness and resilience education, including that of community Lifelines.
    - Communicate ongoing mitigation and disaster preparedness efforts across the county and with neighboring counties.
    - Educate the public on reducing personal risk, including those with access and functional needs (AFN), and increasing property protection.
    - Communicate the importance of the public and community leaders in community preparedness education, inclusive planning, and mitigation strategy.
2. Protect and reduce the impacts to Lifelines, critical facilities, infrastructure, and other community assets from hazards
    - Implement and assess mitigation programs and activities to evaluate progress and effectiveness in reducing risk.
    - Cooperate with area partners in long-term planning efforts and mutual aid agreements.
    - Conduct training and exercises with all agencies in the county, communities, and adjacent jurisdictions to improve preparedness and response capabilities.
    - Review plans, trainings, exercises, and policies frequently to update with any change in hazard risk and any increase of assets.
3. Incorporate hazard mitigation into future development and redevelopment plans and policies
    - Consider adoption of codes, standards, rules, and regulations to aid in mitigation implementation.
    - Incorporate relevant emergency management plans into institutional county plans, documents, and practices.
    - Update existing policy documents and initiatives to include risk reduction principles and ensure inclusion in future documents.

4. Enhance local mitigation capabilities, including human, technical, financial, and regulatory capabilities
    - Collaborate across jurisdictional boundaries and interagency operations to develop and share operational policies, practices, and procedures.
    - Continually evaluate and develop plans, programs, and trainings to improve mitigation capabilities.
    - Identify potential cost sharing opportunities to fund mitigation projects.
5. Improve communication and coordination of mitigation activities between state and local governments and with private and non-profit organizations
    - Build and strengthen partnerships with representatives from all local stakeholders involved in mitigation strategy implementation.
    - Communicate mitigation efforts and success stories across the county, region, and to the state.
    - Invite and encourage participation of government representatives and stakeholders when developing mitigation activities.
    - Coordinate with the state for assistance regarding potential mitigation activities in the county or region.

1.2 2017 Mitigation Actions Report

The HMPC reviewed and reported on the status of mitigation actions from the 2017 HMP. Figure 1.1 illustrates the reported statuses and Table 1.1 breaks down the 2017 mitigation actions by organization and current status of each.

As the progress of actions is evaluated it is crucial to recognize those actions that have been successful.

Elbert County achieved the inclusion of hazard mitigation into 2018 Comprehensive Plan. The county also created an access and functional needs database and stored shelter information in a tool used to coordinate sheltering efforts.

The Town of Elizabeth is making use of numerous platforms to keep residents and other agencies better informed. As the town is developing, water availability is a priority. The town is updating well permits, reviewing additional water sources, and has implemented future development rule for sustainable water resources.

Elizabeth Fire Protection District has made advancements on planning and processes for winter storms, collaborating with county emergency management in identifying shelters, shelter managers, and organizing multiagency response.

As important as acknowledging projects that completed deliverables effectively, actions in a community that are on-going are often overlooked as examples of positive implementation of mitigation strategy. On-going projects are those without a timeline and that may not have deliverables that bring closure to a project but rather continued milestones. Examples include education and outreach efforts, continual work on updating plans and organizational coordination, and constant work to improve processes and infrastructure.

Figure 1.1 2017 Mitigation Action Status

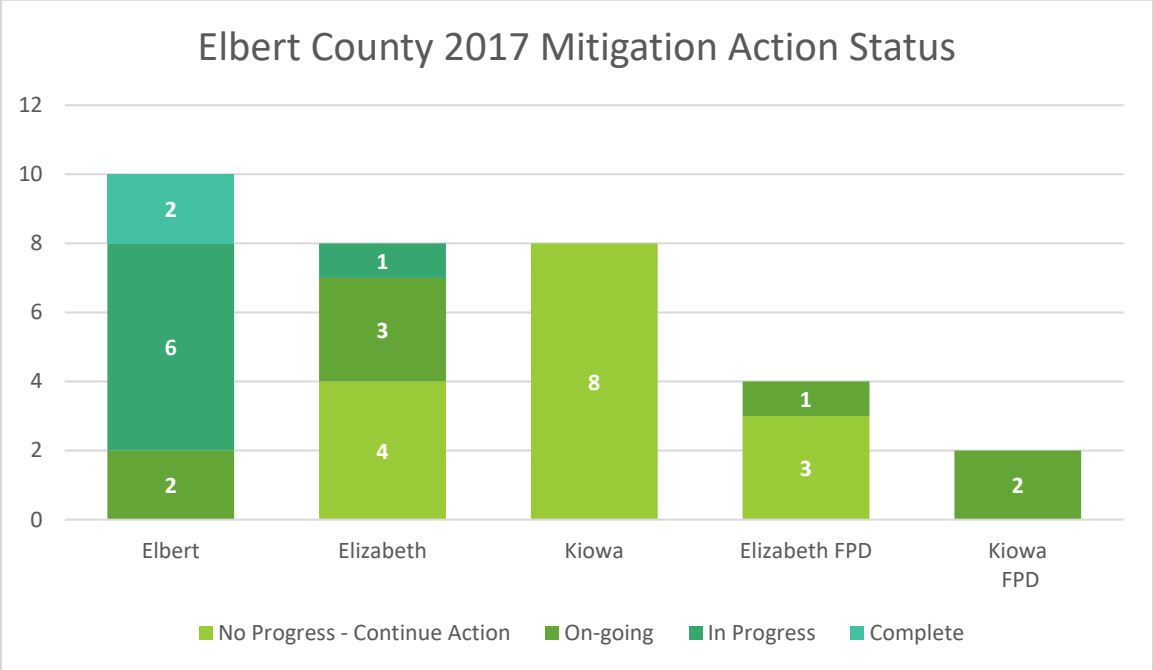


Table 1.1 Status of 2017 Mitigation Actions

ID	Organization	Title	Description	2022 Status	2022 Notes
Elbert - 1	Elbert County	Multi-Hazard	Convene Elbert County Hazard Mitigation Planning Committee semi-annually to monitor, evaluate, and update the hazard mitigation plan.	In Progress	Minimal actions / progress made on goal 4. Goals 3 & 5 - No actions taken
Elbert - 2	Elbert County	Severe Weather, Winter Storm, Tornado	Continue to pursue StormReady designation	On-going	
Elbert - 3	Elbert County	Multi-Hazard	Establish a hazards and risk education campaign	On-going	Education takes various forms, continuing

ID	Organization	Title	Description	2022 Status	2022 Notes
Elbert - 4	Elbert County	Flood	Improve coordination between Community Development, Building, and Road and Bridge departments related to the National Flood Insurance Program (NFIP).	In Progress	Updated flood-plain mapping project in the County has begun. FEMA and AECOM are spearheading
Elbert - 5	Elbert County	Multi-Hazard	Incorporate hazard mitigation in Elbert County Master Plan update.	Complete	2018 Comprehensive Plan update includes a Goal and 6 Policies
Elbert - 6	Elbert County	Flood	Identify and prioritize locations for stormwater drainage system improvements. Devise an implementation plan for identified projects.	In Progress	Still need to coordinate with Public Health
Elbert - 7	Elbert County	Flood	Develop county-wide drainage/erosion mitigation plan — coordinating objectives of various agencies to reduce future flood damage.	In Progress	Still need to coordinate Elizabeth and Kiowa
Elbert - 8	Elbert County	Multi-Hazard	Protect historical community documents through digitization project.	In Progress	Some documentation exists, ongoing process
Elbert - 9	Elbert County	Multi-Hazard	Develop access and functional needs populations' database/inventory/ registry.	In Progress	Database created. Additional coordination between Elbert County and Fire districts needed to consolidate efforts and information sharing.

ID	Organization	Title	Description	2022 Status	2022 Notes
Elbert - 10	Elbert County	Multi-Hazard	Assess and designate shelters and distribute information to public/agencies.	Complete	Shelters identified, stored within incident management tool OEM deploys to coordinate sheltering efforts
Elizabeth - 1	Town of Elizabeth	Flood	Identify and prioritize locations for stormwater drainage system improvements. Devise an implementation plan for identified projects.	On-going	Focus placed on stormwater planning and mitigation during public area updates, and new development
Elizabeth - 2	Town of Elizabeth	Drought	Identify and implement water delivery system improvements.	On-going	Additional water sources are being reviewed, updating well permits and implemented future dev-elopment rule for sustainable water resources
Elizabeth - 3	Town of Elizabeth	Multi-Hazard	Identify and plan a secondary crossing of Running Creek	No Progress – Continue Action	No substantial progress made
Elizabeth - 4	Town of Elizabeth	Multi-Hazard	Establish and implement a public communications protocol to increase coordination with agencies and residents	On-going	Town using social media, setting up email opt-in notifications, exploring Everbridge

ID	Organization	Title	Description	2022 Status	2022 Notes
Elizabeth - 5	Town of Elizabeth	Tornado	Establish a tornado shelter location	No Progress – Continue Action	Admins. determined shelter in place was preferable. Matter will be reviewed again
Elizabeth - 6	Town of Elizabeth	Tornado	Implement a Town-wide tornado siren system	No Progress – Continue Action	Previous budget concerns, renewed interest
Elizabeth - 7	Town of Elizabeth	Multi-Hazard	Establish and implement an Emergency Action Plan for Town Staff and a Continuity of Operations Plan	In Progress	Basic plan was established during COVID. Needs to be updated, revised, and completed
Elizabeth - 8	Town of Elizabeth	Multi-Hazard	Formalize and provision the shelter at Frontier High School	No Progress – Continue Action	Discussing alternatives to high school that was sold
Kiowa - 1	Town of Kiowa	Flood, Dam / Levee Failure	Study and implement levee improvement program for Kiowa levee.	No Progress - Continue Action	
Kiowa - 2	Town of Kiowa	Flood	Identify and implement flood mitigation actions for Kiowa schools.	No Progress - Continue Action	
Kiowa - 3	Town of Kiowa	Flood	Identify and prioritize locations for stormwater drainage system improvements. Devise an implementation plan for identified projects.	No Progress - Continue Action	
Kiowa - 4	Town of Kiowa	Drought	Identify and implement water delivery system improvements.	No Progress - Continue Action	

ID	Organization	Title	Description	2022 Status	2022 Notes
Kiowa - 5	Town of Kiowa	Multi-Hazard	Establish and implement a public communications protocol to increase coordination with agencies and residents.	No Progress - Continue Action	
Kiowa - 6	Town of Kiowa	Flood	Adopt a stormwater ordinance.	No Progress - Continue Action	
Kiowa - 7	Town of Kiowa	Drought	Develop education and incentives program to encourage water savings measures by citizens.	No Progress - Continue Action	
Kiowa - 8	Town of Kiowa	Multi-Hazard	Assess protective measures needed for historic structures.	No Progress - Continue Action	
Simla - 1	Town of Simla	Multi-Hazard	Obtain back-up generators for critical facilities.	Removed	
Simla - 2	Town of Simla	Multi-Hazard	Assess and designate shelters and distribute information to public/agencies.	Removed	
Simla - 3	Town of Simla	Flood	Identify and prioritize locations for stormwater drainage system improvements. Devise an implementation plan for identified projects.	Removed	
Simla - 4	Town of Simla	Flood	Identify and implement water line replacement projects.	Removed	
Elizabeth FPD - 1	Elizabeth Fire Protection District	Wildfire	Plan and upgrade the existing tornado public warning system.	No Progress – Continue Action	Tornado system for the Elizabeth was demobilized as it was not affective for the entire town

ID	Organization	Title	Description	2022 Status	2022 Notes
Elizabeth FPD - 2	Elizabeth Fire Protection District	Winter Storm	Develop a winter storm response plan that encompasses sheltering procedures, access/functional needs prioritization, and organized multi-agency response	On-going	Advancement made on planning and processes with County OEM, identifying shelters, shelter managers and organizing multiagency response
Elizabeth FPD - 3	Elizabeth Fire Protection District	Wildfire	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	No Progress – Continue Action	
Elizabeth FPD - 4	Elizabeth Fire Protection District	Wildfire	Develop wildland urban interface GIS data and maps. Develop zoning updates and outreach for defensible space.	No Progress – Continue Action	County has GIS platform that could provide data
Kiowa FPD - 1	Kiowa Fire Protection District	Wildfire	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	On-going	The Elbert County Fire Chiefs Association meets on a monthly basis to discuss the ongoing challenges of preparing for wild fire mitigation

ID	Organization	Title	Description	2022 Status	2022 Notes
Kiowa FPD - 2	Kiowa Fire Protection District	Wildfire	Develop wildland urban interface GIS data and maps. Develop zoning updates and outreach for defensible space.	On-going	The Elbert County Fire Chiefs Association meets on a monthly basis to discuss the ongoing challenges of preparing for wild fire mitigation
Rattlesnake FPD - 1	Rattlesnake Fire Protection District	Wildfire	Develop an Elbert County Wildfire Protection Program that includes public information, resources, and special events to reduce wildfire risk.	Removed	
Rattlesnake FPD - 2	Rattlesnake Fire Protection District	Wildfire	Develop wildland urban interface GIS data and maps. Develop zoning updates and outreach for defensible space.	Removed	
KCD-1	Kiowa Conservation District	Dam / Levee Failure	Form task force to improve coordination with conservation districts, assess condition of dams, and identify funding sources for repair and maintenance.	Removed	
KCD-2	Kiowa Conservation District	Dam / Levee Failure	Educate public on flood control dam structures, easements, and impacts of new development in dam inundation areas.	Removed	

1.3 2023 Mitigation Actions

Table 1.2 includes all new mitigation actions included in this updated 2023 HMP. In order to prioritize the mitigation actions in this plan, the county and each local government reviewed FEMA's STAPLEE methodology, in addition to a number of additional criteria. This allowed for a careful review of the feasibility of mitigation actions. After this review, there were multiple prioritization criteria considered by the jurisdictions when building and collaborating on the mitigation strategy.

According to FEMA mitigation planning requirements, any prioritization system should have a special emphasis on the extent to which benefits are maximized, based first and foremost on a cost-benefit review of the proposed projects. Following a determination of positive cost-benefit, other criteria considered include:

- Social considerations – life/safety impact
- Administrative considerations – administrative / technical assistance
- Economic considerations – project cost / reductions in future disaster costs
- Alignment with other local objectives
- Environmental considerations
- Lifeline protection
- Legal considerations
- Availability of local funding

During the planning process, it was decided by the HMPC that mitigation actions would be prioritized by each community using a three-tiered High, Moderate, or Low methodology.

"High" priority was primarily designated to those actions with a:

- Moderate to High risk ranking
- Potential high risk to life safety, property, or the environment
- Consideration for the impacts of new development and growth

The county and organizations have numerous actions deemed "High" priority which vary greatly in type, method, and goal. This includes a critical focus on coordination with local governments to leverage capabilities and accomplish common objectives, specifically the county working to assist organizations in tackling flood and wildfire mitigation projects.

"Moderate" priority was in general designated to actions for hazards that were:

- Slow onset
- Localized impact events
- Larger impact hazards with a sporadic occurrence

Planning actions were the majority of those determined to be of "Moderate" priority and this is a matter of placing efforts of collaboration in the most logical order for public safety necessity. The plans that will be created or updated are crucial to the new development in the county, which is a focus in many actions, and are solidified as part of the mitigation strategy.

A "Low" priority would be assigned to low probability hazards in most cases and therefore actions may not be prioritized above or competing with other more practical actions. The one "Low" priority action is based on on-going community preparedness education and outreach efforts. The county puts immense value on public education, especially as the county grows, and outreach is already occurring. The priority

assigned is based on the goal to expand the program and content. At this time, the current program is successful, and the action is an opportunity to further develop the program when funding, staff, and organizational capacity is available.

As part of the planning process, a Mitigation Strategy Action Idea document was developed. This guide identified a number of additional mitigation actions that were considered during development of this mitigation strategy. This guide can be found in the Mitigation Strategy Action Ideas chapter and will be useful for future reference in planning.

The 2023 mitigation actions reflect the common concerns submitted by the public, including shelter availability, preparedness education, tree maintenance and removal, evacuation planning, and wildfire mitigation. Some of the actions addressing these topics are Elbert action 04, Elizabeth actions 01, 02, 04, and many of the fire protection districts' actions.

Table 1.2 2023 Mitigation Actions

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elbert 2023-01	Elbert County	Municipality Support for Fire Mitigation Priorities	Address wildfire mitigation in publicly accessible areas to minimize hazard concerns where municipalities authorize access and responsibility.	H	2, 4.5	Elbert County Emergency Management	Wildfire	Unknown	Grant, Volunteer	2023-2026
Elbert 2023-02	Elbert County	Municipality Support for Flood Hazard Mitigation	Address flood mitigation in publicly accessible areas to minimize hazard concerns where municipalities authorize access and responsibility.	M	2, 4.5	Elbert County Emergency Management	Flood	Unknown	Grant, Volunteer	2024-2027

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elbert 2023-03	Elbert County	Incorporate Hazard Mitigation Planning into Development Planning Process	Incorporate appropriate mitigation actions into development planning review and approval process to ensure existing concerns are addressed. Support current and future mitigation expectations for the county.	H	3, 5	Elbert County Emergency Management	All Hazards	Staff time	County Budget	2023 - Onward
Elbert 2023-04	Elbert County	Community Preparedness Education	Continued development of education program to address comprehensive mitigation benefits and the changing demographics of the county.	L	1,3	Elbert County Emergency Management	All Hazards	$200	County Budget	On-Going

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elbert 2023-05	Elbert County	Develop Continuity of Operations Process for a County Continuity of Operations Plan (COOP)	Conduct a Business Impact Analysis to inform the County how to maintain essential services through the impact of various hazards/threats. Provide guidance on executing continuous operations through pre-prioritizing needs for staff, facilities, resources, and related infrastructure.	M	1, 2, 3, 4	Elbert County Emergency Management	All Hazards	Staff time and $7,200 for software	County Budget	2024/ 2025

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elizabeth 2023-01	Town of Elizabeth	Emergency Preparedness Education	Provide education on hazards, preparedness, and supplies, such as NOAA radios, 72-hour kits, go bags, and best practice for documents.	H	1, 2	Elizabeth, FEMA, Elbert County EM, Red Cross, etc.	All Hazards	Staff Time, Publication Materials	Town budget, outside funding opportu-nities, grants	End of 2024
Elizabeth 2023-02	Town of Elizabeth	Public and Private Tree Maintenance	Trimming and removal of dead and damaged trees in and around Elizabeth.	H	1, 2	Elizabeth, with supporting organizations to be determined	Wildfire, Tornado, Winter Weather, Severe Weather	At least $100,000	Town budget, grants, in-kind work	End of 2026
Elizabeth 2023-03	Town of Elizabeth	Emergency Notification / Siren System	Install a siren/PA system to convey information, notify residents to review media sources/email, and deliver orders for public safety.	M	1, 2, 3	Elizabeth	Wildfire, Tornado, Severe Weather	Unknown	Town budget, outside funding opportu-nities, grants	End of 2026

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elizabeth 2023-04	Town of Elizabeth	Town Evacuation Plan	Develop evacuation plan to create resident awareness of routes and is integrated with the actions for education and emergency notifications.	M	1, 2, 3,	Elizabeth, Fire, Elbert County EM, State Patrol, etc.	Wildfire, Flood	Staff Time	Town budget	End of 2024
Elizabeth 2023-05	Town of Elizabeth	Storm Water Planning	Monitor the current process as development continues to minimize damages caused by severe weather and flood events.	M	2, 3, 4	Elizabeth	Flood, Severe Weather	Unknown	Town budget, develop-ment and impact fees	Ongoing but finalized in 2025

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Agate FPD 2023-01	Agate Fire Protection District	Wildfire Protection Program	Develop an Elbert County wildfire protection program that includes public information, resources to reduce wildfire risk.	M	1,2,3, 5	Elbert County Chiefs Ass.	Wildfire	Unknown	Various	2027
Agate FPD 2023-02	Agate Fire Protection District	Severe Weather Shelter	Create a self-sufficient shelter with power and water and also to be used as a local emergency operations center.	H	2	Agate Fire Protection District	Severe Weather, Winter Weather Tornados	$70,000	District Budget	2025
Agate FPD 2023-03	Agate Fire Protection District	Hazardous Materials Release Preparedness	Prepare the department for response to hazardous materials release incidents.	M	2,4	Agate Fire Protection District	Hazard-ous Materials Release	Unknown	District Budget	2025

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Big Sandy FPD 2023-01	Big Sandy Fire Protection District	Wildfire Public Education	Education of the public on defensible space, hazardous fuels reduction and structure protection.	H	1,2,5	Elbert County Fire Chiefs Association	Wildfire	Unknown	Fire Dept. Budget, Grants	2025
Big Sandy FPD 2023-01	Big Sandy Fire Protection District	Community Partnership for Tornado Safety	Work with the community, schools, and nursing home to ensure procedures are in place for safe zones, shelters etc. in the event of a tornado warning, or tornado spotted on the ground.	H	1,5	Elbert County Fire Chiefs Association	Tornado	Unknown	Fire Dept. Budget, Grants	2024

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Big Sandy FPD 2023-01	Big Sandy Fire Protection District	Winter Weather Roadway Closure	Work with the State and County on early closure of major roadways in a severe winter weather event. Minimize stranded motorists, as shelters and rescue personnel limited.	H	1,4,5	Elbert County Fire Chiefs Association	Severe Winter Weather	Unknown	Fire Dept. Budget, Grants	2025
Elizabeth FPD 2023-01	Elizabeth Fire Protection District	Wildfire Public Education Expansion	Expand public education for wildfire hazard as WUI development increases	H	1,5	Elizabeth Fire Protection District	Wildfire	$45,000	DFPC, CSFS	2024
Elizabeth FPD 2023-02	Elizabeth Fire Protection District	Community Training for Tornado Events	Educate public on preparedness and community planning	M	1,5	Elbert County Emergency Management	Tornado	Staff Time	County Budget	2024

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Elizabeth FPD 2023-03	Elizabeth Fire Protection District	Severe Weather Event Response Support	Support countywide response efforts through improved local government communication and community planning	H	1,5	Elbert County Emergency Management	Severe Weather, Severe Winter Weather	Staff Time	County Budget	2024
Elizabeth FPD 2023-04	Elizabeth Fire Protection District	Hazardous Materials Response Training	Increase number of responders available through training	M	2,4	Elizabeth Fire Protection District	Hazar-dous Materials Release	$20,000	Elizabeth	2025
Elizabeth FPD 2023-05	Elizabeth Fire Protection District	Public Health Response Support	Planning and collaboration between rural government agencies to provide adequate response and resources	M	1,5	Elizabeth Fire Protection District	Public Health Hazard	Staff Time	County Budget	2024

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
Kiowa FPD 2023-01	Kiowa Fire Protection District	Community Education for Wildfire Awareness and Preparation	Improve and expand education and awareness of hazards and risk reduction measures	M	1, 2	Kiowa FPD	Wildfire	Unknown	Grants, County budget	On-going
Kiowa FPD 2023-02	Kiowa Fire Protection District	Tornado Preparation within the Town of Kiowa	Reduce impacts to Lifelines, critical facilities, infrastructure, and community assets through implementation of mitigation planning and actions	M	2, 3	Kiowa FPD, Town of Kiowa	Severe Weather, Tornado	Unknown	Grants, County budget	On-going
Kiowa FPD 2023-03	Kiowa Fire Protection District	Prepare for Propane Release	Work with local propane companies to plan and prepare for a hazardous propane release	M	1, 2, 5	Kiowa FPD	Hazard-ous Materials Release	Unknown	Grants, County budget, private sector	On-going

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
North Central FPD 2023-01	North Central Fire Protection District	Community Education on Fire Mitigation	Educate the community on the goals and tactics for mitigating the fire on their personal property.	H	1	North Central FPD	Wildfire	Staff time	Station Budget	2023
North Central FPD 2023-02	North Central Fire Protection District	Department Fire Fighting Training	Improve fire-fighting abilities through increased training participation	H	2, 4	North Central FPD	Wildfire	Unknown	County Budget	2025
North Central FPD 2023-03	North Central Fire Protection District	Fire Mitigation Resource Increase	Increase Local fire mitigation staff, capabilities, and resources	H	2, 4	North Central FPD	Wildfire	Unknown	County Budget	2025

ID	Organization	Title	Description	Priority	Goals Met	Lead & Support Organizations	Hazards Mitigated	Estimated Project Cost	Potential Funding Source	Expected Complete Year
North Central FPD 2023-04	North Central Fire Protection District	Station Shelter Safety	Increase station capabilities as a safe shelter for all severe weather. Create availability for the fire station to be a place of refuge for mass power outages or disasters.	M	1, 2, 4	North Central FPD	Severe Weather, Winter Weather	Unknown	County Budget	2024
North Central FPD 2023-05	North Central Fire Protection District	Snow Removal Equipment	Purchase a vehicle for snow removal to improve ability to rescue and assist the community in severe winter storms	H	2, 4	North Central FPD	Severe Weather, Winter Weather	Unknown	County Budget	2023

1.4 Mitigation Capabilities

The mitigation capability assessment examines the ability of Elbert County to implement and manage the comprehensive mitigation strategy laid out in this plan. The strengths, weaknesses, and resources of the county are identified here as a means for evaluating and maintaining effective and appropriate management of the county's hazard mitigation program.

Mitigation capabilities are classified into the following types and are detailed in the following tables.

- Planning & Regulatory
  - Plans
  - Building Code, Permitting, & Inspection
  - Land Use Planning & Ordinances
- Administrative & Technical
  - Administration
  - Staff
  - Technical
- Financial
  - Funding Resources
- Education & Outreach
  - Programs & Organizations

Planning and regulatory capabilities are powerful tools for implementing mitigation. The county and communities currently leveraging some of the capabilities in the implementation of mitigation actions.

Table 1.3 Planning and Regulatory Capabilities

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Comprehensive, Master, or General Plan	X	X	
Capital Improvement Program or Plan (CIP)	X		
Floodplain Management Plan		X	
Stormwater Program / Plan		X	
Community Wildfire Protection Plan (CWPP)	X		
Erosion / Sediment Control Program		X	
Economic Development Plan		X	
Other: Required Permits			
Building Codes (Year)	2018	2018	2018
Building Code Effectiveness Grading Schedule (BCEGS) Rating			
Site Plan Review Requirements	X	X	X
Zoning Ordinance (Land Use)	X	X	X

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Subdivision Ordinance	X	X	X
National Flood Insurance Program (NFIP) Participant	X	X	X
Flood Insurance Study / Flood Insurance Rate Map / DFIRM	X	X	X
Floodplain Ordinance	X	X	X
Elevation Certificates for Floodplain Development	X	X	X
Community Rating System (CRS) Participant			
Open Space / Conservation Program			
Growth Management Ordinance			
Stormwater Ordinance		X	
Other Hazard Ordinance (steep slope, wildfire, snow loads, etc.)		X	

Available resources including staff, municipal group, and technology are vital for a community to be able to implement hazard mitigation. Elbert County has a significant staff to accomplish work towards mitigation goals and support the county communities.

Table 1.4 Administrative & Technical Capabilities

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Planning Commission	X	X	X
Mitigation Planning Committee			
Maintenance Programs (tree trimming, clearing drainage, etc.)	X	X	
Emergency Manager	X		
Building Official	X	X	X
Floodplain Administrator	X	X	X
Community Planner	X	X	
Transportation Planner	X		
Civil Engineer	X	X	
GIS Capability	X		
Resiliency Planner			
Warning Systems / Services (flood)	X		

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Warning Systems / Services (other / multi-hazard)	X		
Grant Writing / Management			X

The ability of a community to implement a comprehensive mitigation strategy is largely dependent on available funding. Elbert County and the communities utilize multiple funding sources.

Table 1.5 Financial Capabilities

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Levy for Specific Purposes with Voter Approval	X	X	X
Utilities Fees		X	X
System Development / Impact Development Fee	X	X	X
General Obligation Bonds to Incur Debt	X	X	
Special Tax Bonds to Incur Debt	X		
Withheld Spending in Hazard-Prone Areas			
Open Space / Conservation Fund	X	X	X
Stormwater Utility Fees			
Capital Improvement Project Funding	X	X	
Community Development Block Grants (CDBG)	X	X	

Education and outreach are important capabilities that allow a community to continue the conversation with their public regarding hazard risk and opportunities to mitigate. Elbert County is the only community using resources for education and assisting other communities in public outreach.

Table 1.6 Education & Outreach Capabilities

Mitigation Capability	Elbert County	Elizabeth	Kiowa
Public Hazard Education / Outreach Program	X		
Local Citizen Groups That Communicate Hazard Risks			
Firewise			
StormReady	X		

In addition to the county and community capabilities, the capabilities of the local fire protection districts (FPD) are shown in the FPD Capabilities section. The FPD jurisdictional boundaries are shown in Figure 3.1 Elbert County Overview

1.5 Plan Monitoring and Maintenance

The Elbert County HMPC discussed the Plan maintenance procedures, with the emergency manager serving as the primary point of contact and coordinating all local efforts to monitor, evaluate, and update the Plan. Each participating local government will be responsible for implementing their specific mitigation actions and reporting on the status of these actions to the emergency manager.

Throughout the year, the emergency manager will monitor the progress of mitigation efforts and support the agencies responsible for mitigation actions. The HMPC will meet semi-annually to evaluate the implementation of the Plan through the existing Local Emergency Planning Committee (LEPC) meetings. These semi-annual meetings will be dedicated to discussing the ongoing monitoring of the Plan.

During these meetings in addition to reporting mitigation action implementation progress, the HMPC will:

- Report on
    - the usefulness of the Plan for each jurisdiction
    - any input received from the public
    - how the Plan has been incorporated into other planning mechanisms
- Discuss
    - hazard events and observations
    - mitigation issues and ideas
    - how to keep the attention of community leaders and the public on hazard mitigation problems and opportunities
    - new sources for data to improve future updates
    - other plan updates which may be improved by implementing the HMP
- Give recommendations on specific updates to the Plan
- Work to secure funding and identify multi-objective, cost-share, and other opportunities for partnerships

The emergency manager will check in with each agency responsible for actions in the Plan two weeks prior to the scheduled meetings, to allow time for progress data to be collected. During the meeting, the group will review and discuss their progress and how they have utilized the Plan.

The emergency manager will summarize the outcomes of the meetings and create a report which will be provided to the governing bodies of each participating jurisdiction. After considering the findings of the submitted progress reports, the governing bodies and / or the HMPC may request a follow up with the agency responsible for implementing an action to discuss project conditions.

Throughout the five year life cycle the Plan, the information collected during these meetings as well as consideration of the impacts of significant growth in the county will be evaluated. Awareness of changes in vulnerability, hazards, action progress, new plans, data, or studies taking place is critical to a comprehensive plan update. These will be assessed as the county population grows and its capabilities evolve.

1.6 Planning Integration

One of the 2017 mitigation actions for the county was to include hazard mitigation into the updated master plan. This was a successful implementation with the 2018 Comprehensive Plan Update for the

county, resulting in a plan goal relating specifically to hazard mitigation and the development of six related policy recommendations.

These suggestions propose that the implementation strategy of the plan's goals include the consideration of hazard mitigation in the development and maintenance of Site Design Standards for Development (Residential, Commercial, and Industrial) in the county, as well as the reference of the hazard mitigation plan in the County-wide Zoning and Subdivision Regulations.

A potential hazard specific regulation in the plan is the development of a Wildland Urban Interface (WUI) code and standards. The HMPC pointed out that this topic is currently leading a statewide discussion, as well. State officials have begun work on legislation for WUI codes and the potential for new regulations across the state including development considerations, building materials, and expectations for implementing defensible space measures. The HMPC acknowledges the need for awareness on how any legislative action may impact the plan and will update accordingly.

The 2021 Transportation Master Plan is a valuable tool in planning integration, as many of the identified projects are related to mitigation implementation. The prioritization framework used in the plan includes preservation and resiliency, incorporating known flooding issues, known high-maintenance intensity of roadways with significant travel, and pavement and bridge conditions which align with the direction of the county's mitigation strategy. This also aligns with numerous responses seen in the public risk perception community survey, in which maintenance of roadways was identified as a priority by 5% of respondents.

The Mitigation Strategy Action Ideas document is a compilation of the mitigation action ideas from the public survey, existing community plans, on-going FEMA flood study, and other resources. This document provided an array of ideas to continue to improve integration across the county.

1.7 Continued Public Engagement

The community survey created for the Plan update was well received and the public shared many ideas. A considerable amount of the survey comments regarded the need for workshops and educational opportunities, including making literature and recordings available for those who cannot attend. The HMPC discussed the various materials distributed currently; however, the recognition of populations being missed is important. The HMPC will work closely with the public information officer to share information in the future and see this collaboration and momentum as a way to continue public outreach.

The HMPC also discussed how to reach residents who may not have any understanding of hazard mitigation. This included the idea of a dedicated hazard mitigation website with easy access to information in one place, utilizing developers coming into the area to educate new home owners, and utilizing channels that may be non-traditional, such as Public Health, for outreach to populations served.

A 2020 National Community Survey conducted in the county showed that residents appreciate where they live and their quality of life. In this survey residents expressed that safety, the natural environment, and utilities are of high importance and high quality in the county. As hazard mitigation is often focused on these same topics, the HMPC believes this updated Plan will allow the county to continue to prioritize protection of these resources.

Other potential ideas introduced by the HMPC related to creating a citizen committee for hazard mitigation input, ensuring local leadership consistently attends meetings and events, and utilizing the robust communications structure already within the county to keep residents informed and their voices heard.

2 PLANNING PROCESS

2.1 Background

The 2023 Elbert County hazard mitigation plan (HMP) is an update to the 2017 Plan. HMPs are community-led efforts designed to identify, manage, and avoid risks through pre-planning. This plan is designed to reduce the risks posed by hazards that affect Elbert County communities and must be updated and approved by the Federal Emergency Management Agency (FEMA) every five years to keep it current and to maintain eligibility for Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) Grants.

2.1.1 What is Hazard Mitigation?

The term "hazard mitigation" describes actions that can help reduce or eliminate long-term risks caused by hazards such as floods, wildfires, and severe weather. Hazard mitigation is best accomplished when based on a comprehensive, long-term plan developed before a disaster strikes. As the costs of disaster recovery continue to rise, governments and citizens must find ways to reduce community hazard risks. Oftentimes after disasters, repairs and reconstruction are completed in such a way as to simply restore damaged property to pre-disaster conditions. These efforts may "get things back to normal," but the replication of pre-disaster conditions often results in a repetitive cycle of damage, reconstruction, and repeated damage. Hazard mitigation breaks this repetitive cycle by producing less vulnerable conditions through pre- and post-disaster repairs and reconstruction. The implementation of such hazard mitigation actions by state and local governments means building stronger, safer, and smarter communities that will be able to reduce future disaster losses.

2.1.2 Purpose

Mitigation is an investment in a community's future safety and resiliency. Recent cost-benefit studies have proven mitigation to be cost effective for communities, with mitigation projects overall returning six dollars for every one dollar spent. Hazard mitigation planning helps residents, business owners, elected officials, and municipal departments think through how to plan, design, build, and establish partnerships for risk reduction. Consider the critical importance of mitigation to:

- Protect public safety and prevent loss of life and injury.
- Reduce property damage to existing and future development.
- Maintain community continuity and strengthen the social connections that are essential for recovery.
- Prevent harm to a community's unique economic, cultural, and environmental assets.
- Minimize operational downtime and accelerate recovery of government and business after disasters.
- Reduce the costs of disaster response and recovery and the exposure to risk for first
- responders.
- Help accomplish other community objectives such as capital improvements, infrastructure protection, open space preservation, and economic resiliency.

Additionally, Elbert County and its local governments will benefit from this HMP by:

- Ensuring eligibility for all sources of hazard mitigation funds made available through FEMA.
- Increasing public awareness and understanding of vulnerabilities, as well as support for specific actions to reduce losses from future disasters.
- Ensuring community policies, programs, and goals are compatible with reducing vulnerability to all hazards and identifying those that are incompatible.
- Building partnerships with diverse stakeholders, increasing opportunities to leverage data and resources in reducing workloads, as well as achieving shared community objectives.
- Expanding the understanding of potential risk reduction measures to include: local plans and regulations; structure and infrastructure projects; natural systems protection; education and awareness programs; and other tools.
- Informing the development, prioritization, and implementation of mitigation projects. Benefits accrue over the life of these projects as losses are avoided from each subsequent hazard event.

2.1.3 Scope

This 2023 HMP has been prepared to meet requirements set forth by FEMA and the Colorado Division of Homeland Security and Emergency Management (DHSEM) in order for Elbert County and its local governments to be eligible for funding and technical assistance from state and federal hazard mitigation programs. This Plan will be updated and FEMA-approved within its five-year expiration date.

2.1.4 Authority

This HMP has been adopted by Elbert County and its participating local governments in accordance with the authority granted to counties and municipalities by the State of Colorado. This Plan was developed in accordance with current state and federal rules and regulations governing local HMPs. The Plan shall be monitored and updated on a routine basis to maintain compliance with the following legislation and guidance:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, Mitigation Planning, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and by FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201

The following FEMA guides and reference documents were used to prepare this document:

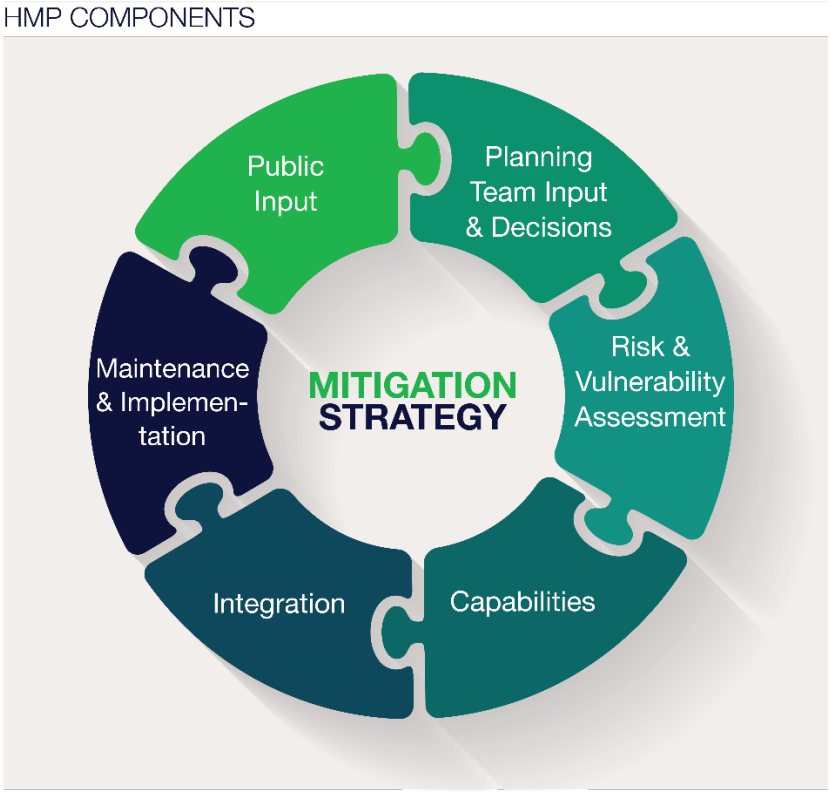
- FEMA. Local Mitigation Plan Review Guide. October 1, 2011.
- FEMA. Local Multi-Hazard Mitigation Planning Handbook. March 2013.

2.1.5 Update Process and Methodology

The planning process involved a series of meetings and workshops with the hazard mitigation planning committee (HMPC), while also gathering and analyzing the latest hazards data. These meetings involved feedback and guidance on plan content, communication for community outreach, and gathering public input to further inform the Plan. The following section details the timeline and methods of public outreach, HMPC meetings, and plan development.

A high-level summary of the components that assembled into the updated HMP is presented in Figure 2.1.

Figure 2.1 HMP Components



From a 'big picture' standpoint, the HMPC identified the following overarching project goals:

- Obtaining FEMA Approval
- Broadening jurisdictional collaboration and participation
- Improving public engagement
- Increasing mitigation grant funding pursuits

Input into the planning process came from a number of entities, shown in Figure 2.2.

Figure 2.2 Planning Process Inputs

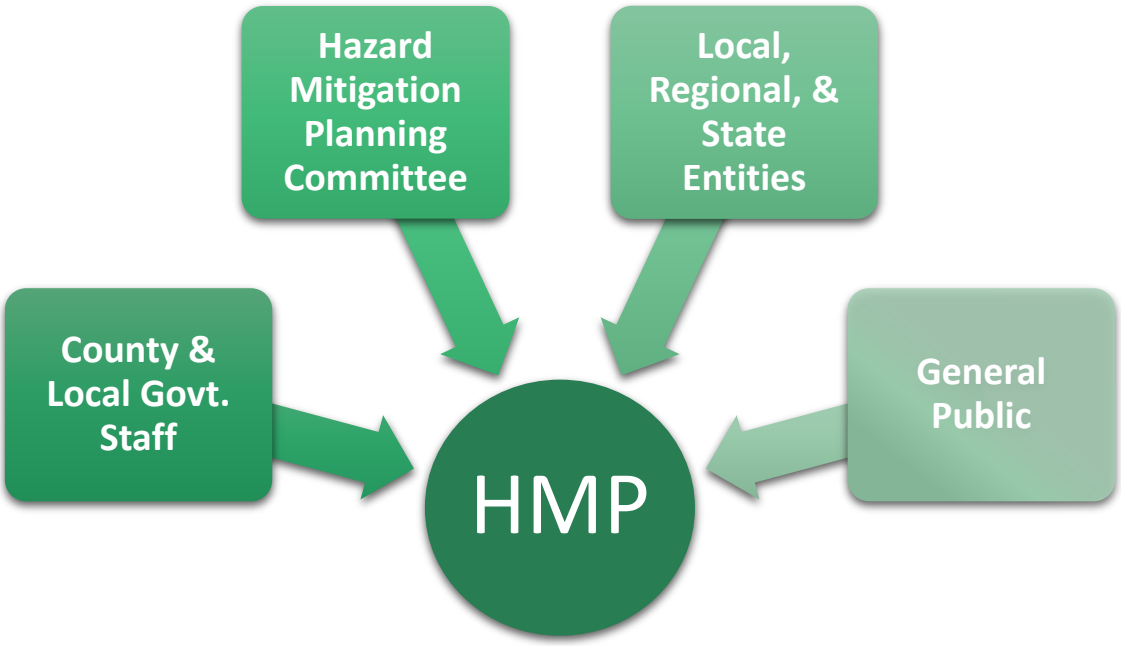


Figure 2.3 summarizes the project schedule, including HMPC and public touchpoints over the course of the planning process.

Figure 2.3 Project Milestones



2.1.6 Participating Local Governments

All municipalities and special districts in Elbert County were invited by the county to participate in the planning process. An overview map of the county, Figure 3.1, illustrates the location of municipalities and special districts. They were informed of the participation requirements related to the adoption of the Plan and the formation of the HMPC. The following organizations were formal participants in the planning process and have formally adopted this Plan:

- Elbert County
- Town of Elizabeth
- Elizabeth Fire Protection District
- Kiowa Fire Protection District
- Big Sandy (Simla) Fire Protection District
- North Central Fire Protection District
- Agate Fire Protection District

Local governments that participated in portions of the planning process, but have opted not to formally adopt the HMP include:

- Town of Kiowa
- Rattlesnake Fire Protection District

Participation in the planning process was closely tracked to ensure all entities remained engaged across the planning process. Table 2.1 shows organizational participation at HMP workshops and webinars.

Table 2.1 Organizational Participation

	Kick-Off Webinar May 26th 2022	Risk Assessment Workshop August 16th, 2022	Mitigation Strategy Workshop October 25th, 2022	Fire Chiefs Meeting October 27th, 2022
Elbert County	X	X	X	X
Town of Elizabeth	X	X	X	
Town of Kiowa	X	X		
Elizabeth FPD	X	X	X	X
Rattlesnake FPD				X
Kiowa FPD				X
Agate FPD				X
Elbert FPD				X
North Central FPD				X
Big Sandy (Simla) FPD				X

2.2 Hazard Mitigation Planning Committee

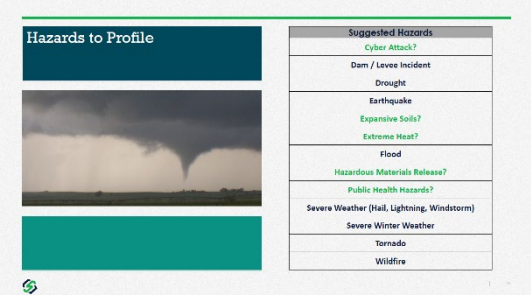
The full HMPC roster is included in a later section of this Plan, Hazard Mitigation Planning Committee Roster.

2.2.1 HMPC Coordination

Kickoff Meeting (May 25th, 2022)

The kickoff meeting was held virtually via webinar in May. The meeting began with an introduction to the planning process, schedule, and responsibilities of the planning committee, as well as an overview of hazard mitigation. Discussion then focused on the list of hazards to profile, including cyber attack, extreme heat, hazardous materials release, and public health hazards which were not profiled in the 2017 plan.





Participants were invited to discuss how the 2017 plan was used and what elements worked well, in addition to other on-going or recently completed community planning projects. Another main topic included an introduction to the public outreach portion of the planning process and the group was encouraged to comment on the public outreach tools and processes that work best. Initial discussions relating to available mitigation grant funding, including FEMA's new Building Resilient Infrastructure & Communities (BRIC) Program, also helped to educate the committee.

Additional topics included an introduction to the Lifeline construct used by FEMA and plan requirements to achieve FEMA approval. Previous hazard events over the last five years and any ongoing community mitigation efforts were also discussed by the committee. Group discussion focused on the definition and application of the hazards being added to the 2022 plan, and a review of the participating jurisdictions. To encourage dialogue in a virtual presentation, live polling was used to present the results of polls, in real-time, while gathering input from the HMPC. The results of the polls are included below and throughout this plan to support what was heard.

Figure 2.4 Planning Committee Previous Participation

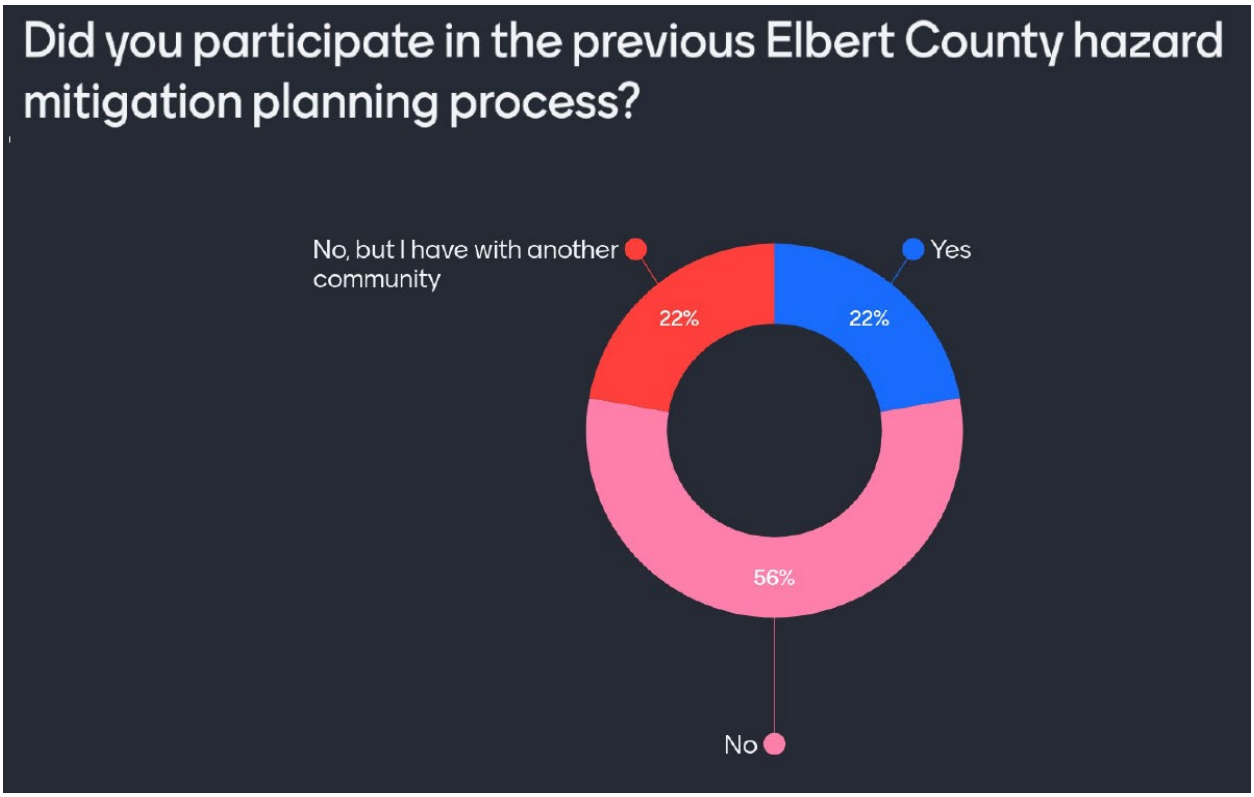


Figure 2.5 Planning Committee Response to Hazard Profile Updates

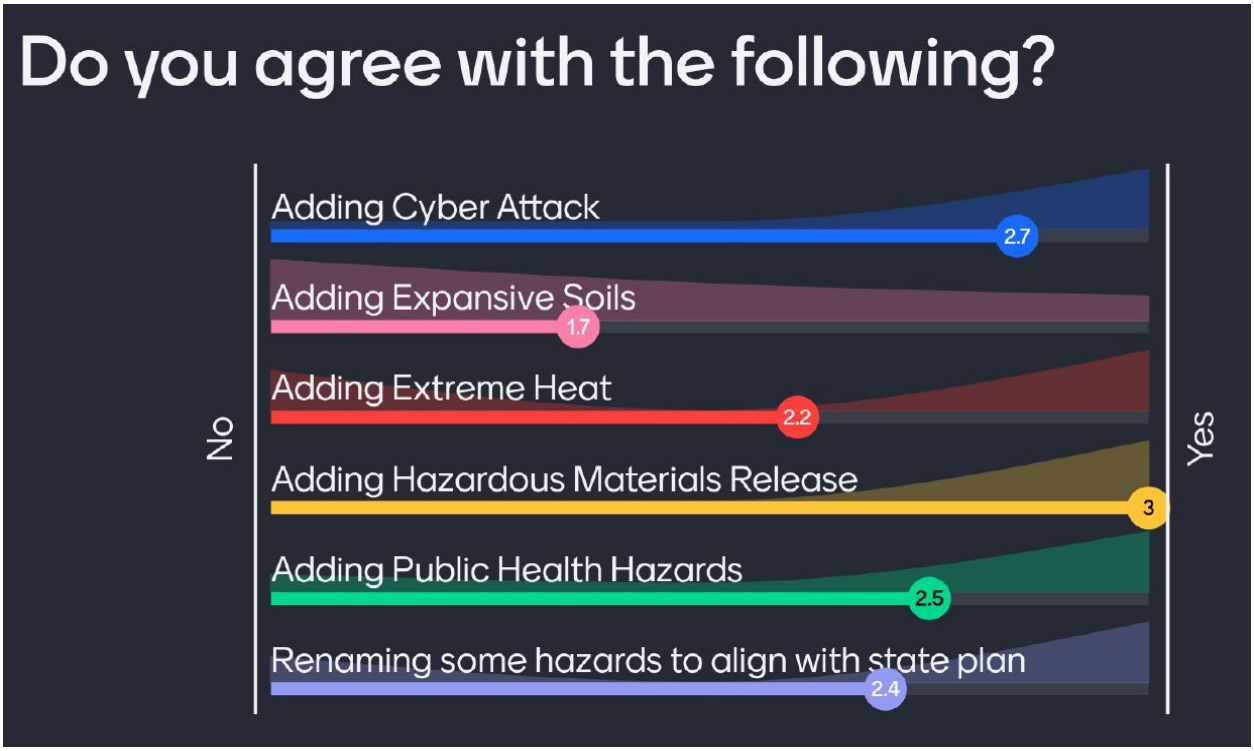


Figure 2.6 Planning Committee Responses for Engagement Tools



At the end of the meeting, participants were given four action items:

- Provide the best available hazard data and recent / ongoing community plans
- Help expand the HMPC roster
- Provide input on the public involvement plan
- Begin reporting on 2017 mitigation actions
- Assist with dissemination of the public involvement plan's messaging

Hazard Identification and Risk Assessment Workshop (August 16th, 2022)

The HIRA workshop was held in person in Kiowa. Discussion in this meeting focused on the preliminary results of the risk assessment. Each hazard was reviewed, and best available data was presented pertaining to the risk and vulnerability assessment. Additional historical events and data gaps were discussed with the committee.

During the workshop, funding was identified as an obstacle to implementing mitigation. Primarily this is due to the lack of awareness and familiarity of programs and uncertainty regarding future funding pursuits. This recognition prompted continued discussion of FEMA mitigation funding programs and the available support from the state. Two representatives from the DHSEM state mitigation planning office were in attendance and shared valuable information with the HMPC.

Following this, a lengthy discussion focused on the current Plan's mitigation strategy and the goals were refined based on committee input. It was decided by the HMPC that objectives should accompany the goals in this plan update and a follow-up survey was conducted to solicit input on these new objectives.

Based on the HMPC hazard ranking polling responses, where wildfire was determined to have the highest risk, a valuable conversation around Community Wildfire Protection Plans (CWPP) was started and a representative from the Colorado State Forest Service (CSFS) shared significant information regarding wildfire mitigation grants and support for developing a CWPP.

To encourage participation from all workshop participants, live polling was used to present the results of polls, in real-time, during HMPC discussions. The results of the polls are included below and throughout this plan to support what was heard.

Figure 2.7 Planning Committee Responses for Most Vital Lifelines

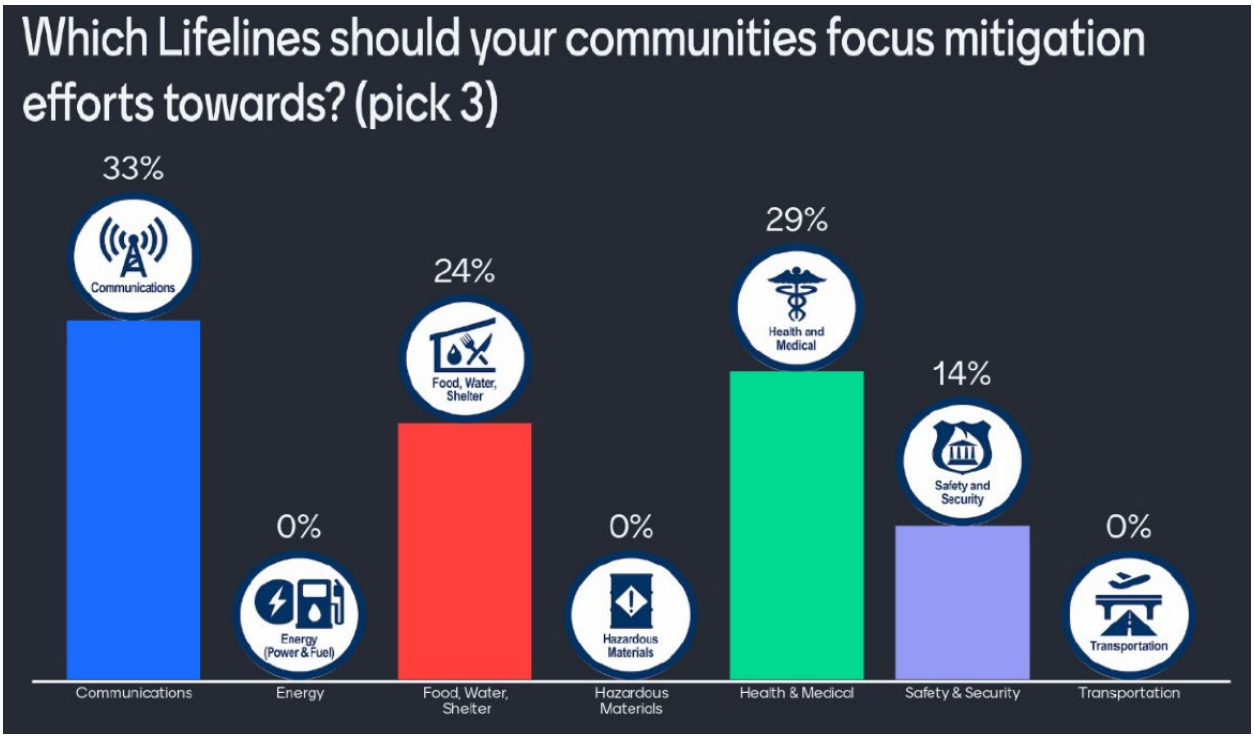


Figure 2.8 Planning Committee Responses for Biggest Implementation Obstacles

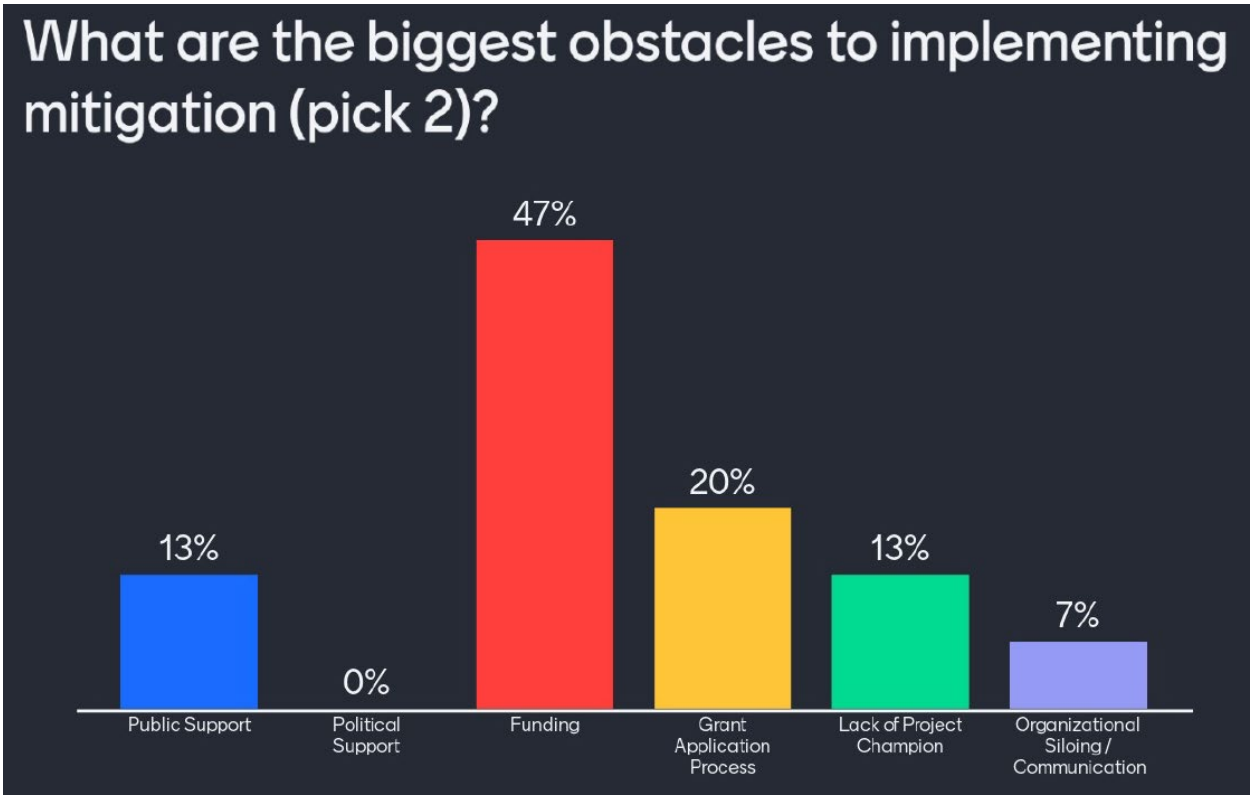
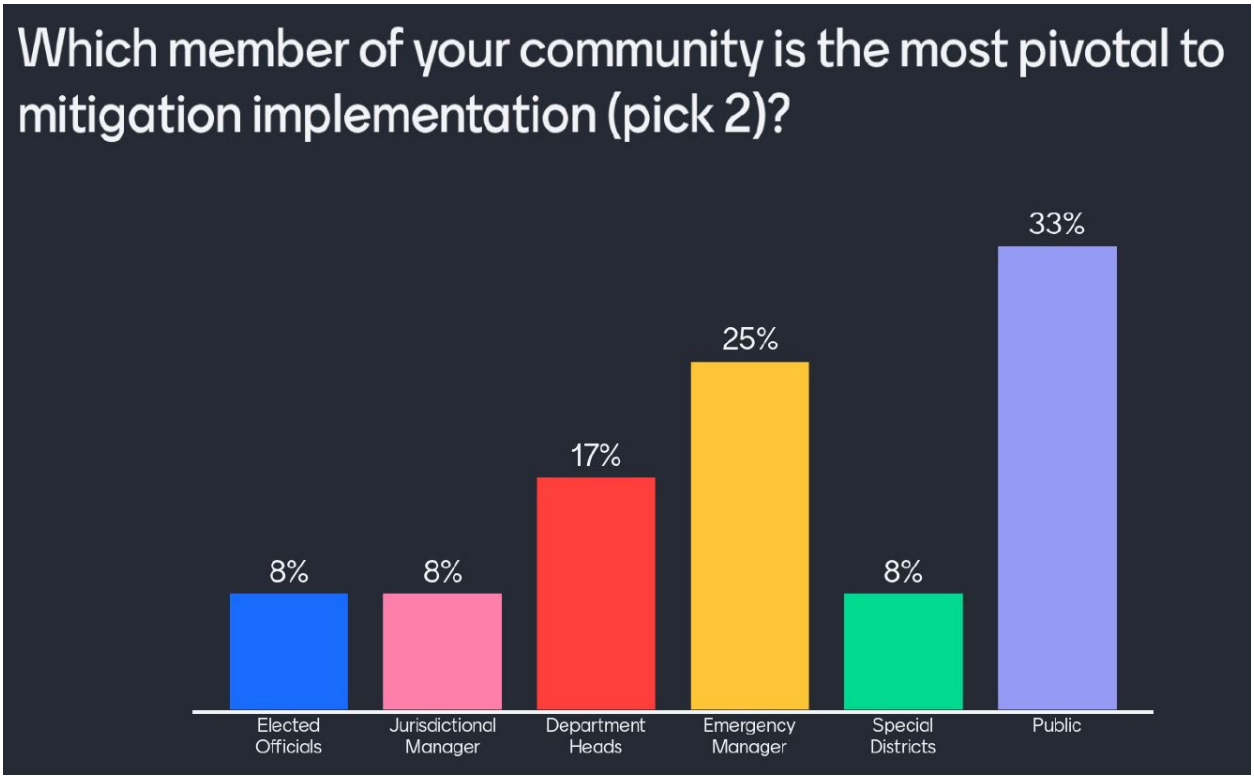


Figure 2.9 Planning Committee Response for Pivotal Community Member



At the end of the workshop, participants were given the following action items:

- Assist with continued dissemination of the public involvement plan's messaging
- Begin drafting new 2023 mitigation actions
- Complete a mitigation capability assessment
- Provide hazard risk rankings specific to their local government
- Provide additional comments on the mitigation strategy's goals and input on objectives
- Provide comments on the updated Hazard Identification & Risk Assessment chapter

Mitigation Strategy Workshop (October 25th, 2022)

The mitigation strategy workshop was held in a hybrid-digital format in Kiowa, CO. The workshop resulted in multiple discussions with the HMPC relating to mitigation funding, grant writing, mitigation action development, community wildfire protection plans (CWPP) elements, public outreach and involvement, and local government engagement.



In discussing mitigation action development, HMPC members were interested in connecting with neighboring counties, expressing a desire to meet with them, as well as review other county HMP actions. This conversation evolved into potential partnering for funding and thinking outside of the box by pooling resources in the county to hire a grant writer or partnering with

another county. Resources were shared relating to project scoping and utilizing the state HMGP funds from COVID-19. A brief conversation occurred regarding the importance of considering developing a standalone CWPP, as the HMP process develop a number of CWPP elements required for those plans.

The HMPC discussed incentives for public involvement in mitigation, pointing out that by providing the community resources, instead of requirements, is the best way to keep the public invested. The topic of the public involvement brought to the forefront the concern of local officials engagement and ideas of having leadership specific educational workshops to gain crucial political support. The HMPC covered a variety of topics during the workshop and made a point to continue the conversation at a time when those who were unable to make it could attend.

At the end of the workshop, participants were given two action items:

- Identify new 2023 mitigation actions
- Review the final HMPC draft of the plan

County Fire Chiefs Meeting (October 27th, 2022)

To ensure all wildfire-related project deliverables were accomplished, the Elbert County Fire Chiefs provided time during their monthly meeting to discuss the HMP and remaining inputs. Fire Chiefs from all seven fire protection districts were in attendance and were able to learn more about the benefits of formally adopting the HMP. Future grant eligibility was a topic that was further discussed.

At the end of the meeting, participants were given the following action items:

- Identify the county's wildland urban interface (WUI)
- Perform a FPD capability assessment
- Define those preferred methods to reduce structural ignitibility
- Identify fuel treatment projects

Planning Committee Draft Plan Review

Upon completion of the final draft plan, the HMPC was provided an opportunity to review and comment on the document. All comments received from the HMPC were incorporated.

2.3 Public and Stakeholder Participation

Public involvement is crucial to a representative hazard mitigation plan update. Elbert County has robust public communications and there were multiple opportunities to share the information regarding the Plan's update. In the community survey, community members identified email, social media, and web postings as the preferred methods of communication. Newsletters / mailings were next on the list which informed the county that the monthly newsletter, the *Prairie Time*s, would get the word out in addition to digital means. The September edition is shown below, followed by examples of postings on various social media platforms, and emails to the county leadership and staff.

Elbert County Connection

Keeping citizens informed and up-to-date on county government

County Fairgrounds Get a New and Improved Look

The fairgrounds are an important venue for the Elbert County community and are home to the annual Elbert County Fair that recently wrapped up its 88th year. To that end, several exciting renovations have been completed and will positively impact residents and visitors who enjoy this fantastic local amenity. Renovations include:

• A newly remodeled campground. This year, the fairgrounds went from 32 to 72 RV sites. The renovations include all new electric and water hookups along with new grading for drainage.

This is a significant upgrade, as fair attendees for years had to contend with an older electrical system that was unable to handle the load, as well as continual drainage issues.

• An updated sound system for the warm-up arena and horse pavilion. Thanks to some grant money received, the County made much-needed upgrades. The facilities team no longer has to drag portable sound systems around, risking trip hazards. With the remainder of the grant money, two sets of portable bleachers that seat a hundred people each were purchased.

• A new fence around the warm-up arena. The arena was previously in bad shape, with rotting boards and posts. Thanks to a generation donation from the Elbert County Friends of Fair, the facilities team was able to replace it with all new panels and gates. This has dramatically boosted the appearance of the fairgrounds while adding another level of safety to the arena.

• Updated lighting around the entire fairgrounds. Visitors will have a better experience navigating the fairgrounds thanks to new and improved lighting.



These renovations will create a more comfortable experience for vendors, spectators, visitors and event producers for years to come. Elbert County offers the entire fairgrounds to the public not just for the annual fair but for a wide array of events throughout the year, including:

- Rodeos
- Craft shows
- Weddings
- Trade, camping, horse and livestock shows
- Conferences
- Birthday parties

"Elbert County Board of County Commissioners, along with CSU Extension, Friends of Fair, and the Elbert County Fair Board, have committed to making our Fairgrounds a desirable venue not only for the Elbert County Fair and our 4-H program but for our community as a whole," says Bobby Chevarria, Facilities Manager for the fairgrounds. "Elbert County believes in keeping our agricultural way of life alive and well through our 4-H programs and by providing a place for our community to come together and enjoy fellowship through various events." ♦

Free and Discounted Health Screenings: Attend on Oct. 8 from 8:00 to noon

In the recently completed Community Health Assessment, access to healthcare was identified as one of the most important concerns among County residents. In response to this need, Elbert County Public Health is partnering with 9 Health: 365 to host a Community Health Fair at the County fairgrounds in Kiowa on Saturday, October 8, from 8:00 a.m. – noon.

Whether you're pursuing a healthier lifestyle, taking advantage of the free screenings, or raising your health-related awareness, attending the Health Fair will offer many benefits for attendees. Health screenings, especially low-cost and free ones, are vital to maintaining good health. Many major diseases go undetected because they show no signs or symptoms. The Health Fair is for everyone, regardless of insurance status. We will have the supplies and resources to serve everyone who attends. Our goal is to reach as many residents as possible to help them take ownership of their health. The Health Fair will offer participants peace of mind in knowing where they stand with their health and can help prevent more serious issues.

The Health Fair will offer blood work to adults over age 18 for a small fee. Additionally, various free and low-cost screenings will be available, including blood pressure, mental health, vision, and more. Registered Nurses and Nurse Practitioners will also be available to answer health questions. Many people find that attending a 9 Health:365 Fair provides more information than their healthcare provider's offices typically order. Some participants report that the co-pay associated with a doctor's visit costs more than attending a Health Fair, too. If participants have a critical or out-of-range value in their lab results, they will receive a call within 24-72 hours. A medical professional will recommend what follow-up care to seek and can help you find resources for follow-up care if you do not have a primary care physician. ♦

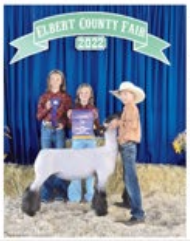
2022 Elbert County Fair Highlights: Record-Breaking Junior Livestock Sale & Impressive Attendance

The Elbert County Fair returned to Kiowa for its 88th year in late July and early August. Thanks to generous sponsors that included CORE Energy and Maverix Broadband, all events at the fair were free, including free admission and parking.

Attendance for the eight-day fair was terrific and popular events like the Horseshoe Tournament, Rodeo with Mutton Bustin' and concert were crowd-pleasing favorites.

Record-Breaking Junior Livestock Market Sale

An annual tradition at the fair each year is the Junior Livestock Market Sale. The kidswho participate in this program have invested their time, talents, and substantial money in caring for and feeding their premium stock. Market sales of beef, lamb, swine, goat, rabbit and poultry totaled a record-breaking $850,000, up $90,000 from last year's total.



The top market earners this year included the following:

- Grand Champion Beef - Shown by Kelli Kerchal, purchased by Stretch Transport, LLC for $16,330.
- Grand Champion Lamb - Shown by Harlan Summers, purchased by Summers Construction for $7,500.



- Grand Champion Swine - Shown by Troy McWhorter, purchased by Elizabeth Locker Plant for $6,840.
- Grand Champion Goat - Shown by Soren Freund, purchased by Colorado Animal Health for $5,150.
- Grand Champion Poultry - Shown by Liam Braun, purchased by High Plains Food Store for $2,300.
- Grand Champion Rabbit - Shown by Dayton Tervort, purchased by High Plains Food Store for $800.

4-H helps develop lifelong skills in its members. These skills come in the form of leadership, citizenship, responsibility, good sportsmanship and financial management. The livestock sale often provides 4-H members with money to put toward college, invest in their own livestock or recover the project's cost. ♦

Give Blood. Save Lives.

Eligible Elbert County residents and local workers are encouraged to donate blood to help ensure lifesaving blood and plasma is available for patients with traumatic injuries and other serious medical needs. When you give blood with Vitalant, you have the potential to help local hospitals and, when the need arises, others across the country.

Elbert County Public Health is hosting a blood drive on Tuesday, Sept. 27, from 10 a.m. – 2 p.m. at the Elbert County Fairgrounds Exhibit Building at 95 Ute Avenue in Kiowa. Appointments are encouraged, but not required.

To schedule an appointment, call 303-363-2300 or visit donors.vitalant.org and enter Blood Drive Code 3184276.

metroDPA Offers Homebuyer Assistance

metroDPA, a program offering 30-year fixed-rate mortgages with down payment assistance, is available to homebuyers in Elbert County with an annual income below $176,700.

The program provides various levels of assistance—up to 5%—that help borrowers with closing costs and the required down payment to buy a house. The assistance is 0% interest and forgiven monthly over three years. After three years, absolutely no repayment is required. metroDPAalso offers multiple options and competitive rates.

In today's high-priced market, having a program like metroDPAto assist can make all the difference to future home owners.If you are interested in this program, please visit metroDPA.org for more information.

County Assesses Hazard Mitigation Strategies

Take our survey to share your thoughts

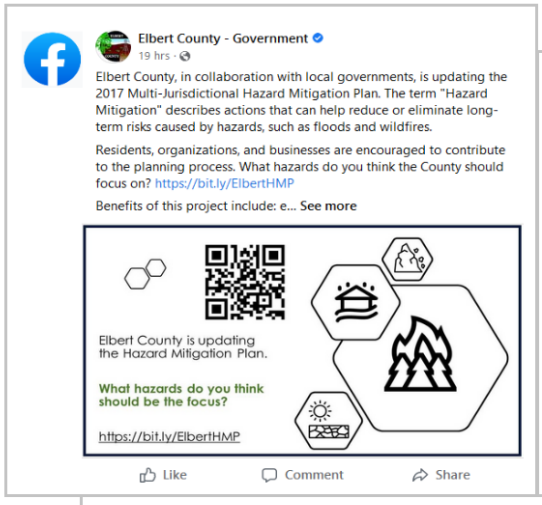
Elbert County, in collaboration with local municipalities, districts, and other community organizations, is updating its 2017 Hazard Mitigation Plan. This plan develops community mitigation strategies to help reduce the risks posed by hazards. The plan must be updated and approved by FEMA every five years to keep it current and to maintain eligibility for hazard mitigation grant assistance.

Take the Survey

Residents, organizations, and businesses are encouraged to contribute to the planning process. Take our online survey by Sept. 30 at https://bit.ly/ElbertHMP to identify hazards you think the County should focus on.

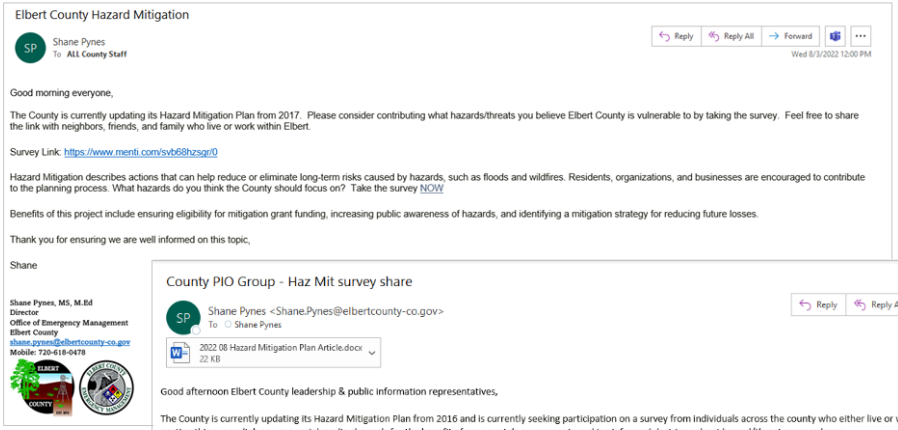
A copy of the current 2017 Elbert County Hazard Mitigation Plan can be found online at https://drive.google.com/file/d/1zwAOnhkNyn-ZBhs_hp8sizIJFVQfshO/view.

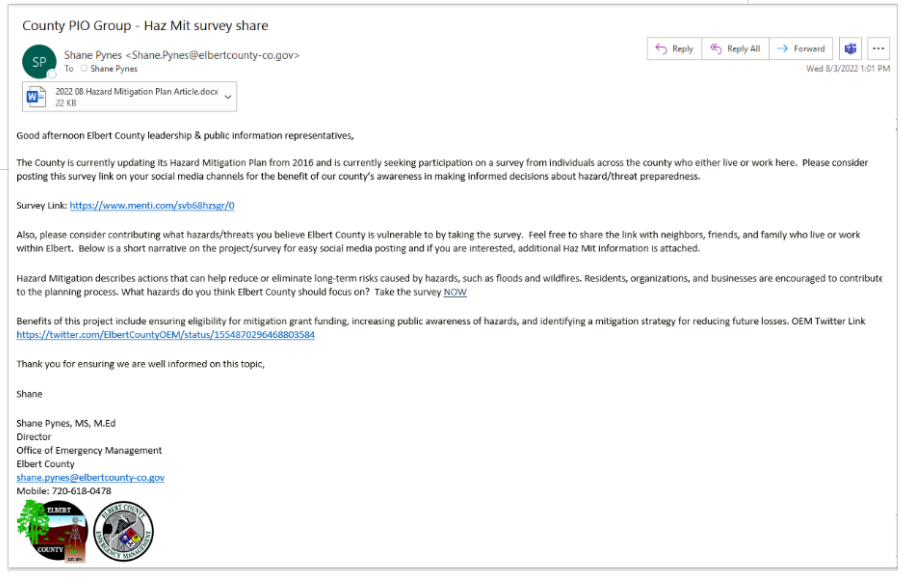
Direct any questions to Michael Garner, mgarner@synergy-dr.com, who is leading the plan's development.


Elbert County - Government
19 hrs
Elbert County, in collaboration with local governments, is updating the 2017 Multi-Jurisdictional Hazard Mitigation Plan. The term "Hazard Mitigation" describes actions that can help reduce or eliminate long-term risks caused by hazards, such as floods and wildfires.
Residents, organizations, and businesses are encouraged to contribute to the planning process. What hazards do you think the County should focus on? https://bit.ly/ElbertHMP
Benefits of this project include: e... See more
Elbert County is updating the Hazard Mitigation Plan.
What hazards do you think should be the focus?
https://bit.ly/ElbertHMP
Like
Comment
Share


Elbert County OEM @ElbertCountyOEM · Aug 3
Elbert County, in collaboration with local governments, is updating the 2017 Multi-Jurisdictional Hazard Mitigation Plan. What hazards do you think the County should focus on?
bit.ly/ElbertHMP
Stay tuned for future surveys and engagement opportunities.
Elbert County is updating the Hazard Mitigation Plan.
What hazards do you think should be the focus?
https://bit.ly/ElbertHMP


nextdoor
Hazard Mitigation Plan Survey:
Director of Emergency Management Shane Pynes from Elbert County Office of Emergency Management · 21 hr ago
6
Elbert County, in collaboration with local governments, is updating the 2017 Multi-Jurisdictional Hazard Mitigation Plan. The term "Hazard Mitigation" describes actions that can help reduce or eliminate long-term risks caused by hazards, such as floods and wildfires.
Residents, organizations, and businesses are encouraged to contribute to the planning process. What hazards do you think the County should focus on? https://bit.ly/ElbertHMP
Benefits of this project include: ensuring eligibility for mitigation grant funding, increasing public awareness of hazards, and identifying a mitigation strategy for reducing future losses.
Stay tuned for upcoming public surveys and project engagement opportunities.
21 hr ago · Subscribers of Elbert County Office of Emergency Management in General
THANK | 1
REPLY


Elbert County Hazard Mitigation
Shane Pynes
To ALL County Staff
Reply
Reply All
Forward
Wed 8/3/2022 12:00 PM
Good morning everyone,
The County is currently updating its Hazard Mitigation Plan from 2017. Please consider contributing what hazards/threats you believe Elbert County is vulnerable to by taking the survey. Feel free to share the link with neighbors, friends, and family who live or work within Elbert.
Survey Link: https://www.menti.com/svb68hzsgr/0
Hazard Mitigation describes actions that can help reduce or eliminate long-term risks caused by hazards, such as floods and wildfires. Residents, organizations, and businesses are encouraged to contribute to the planning process. What hazards do you think the County should focus on? Take the survey NOW
Benefits of this project include ensuring eligibility for mitigation grant funding, increasing public awareness of hazards, and identifying a mitigation strategy for reducing future losses.
Thank you for ensuring we are well informed on this topic,
Shane
Shane Pynes, MS, M.Ed
Director
Office of Emergency Management
Elbert County
shane.pynes@elbertcounty-co.gov
Mobile: 720-618-0478

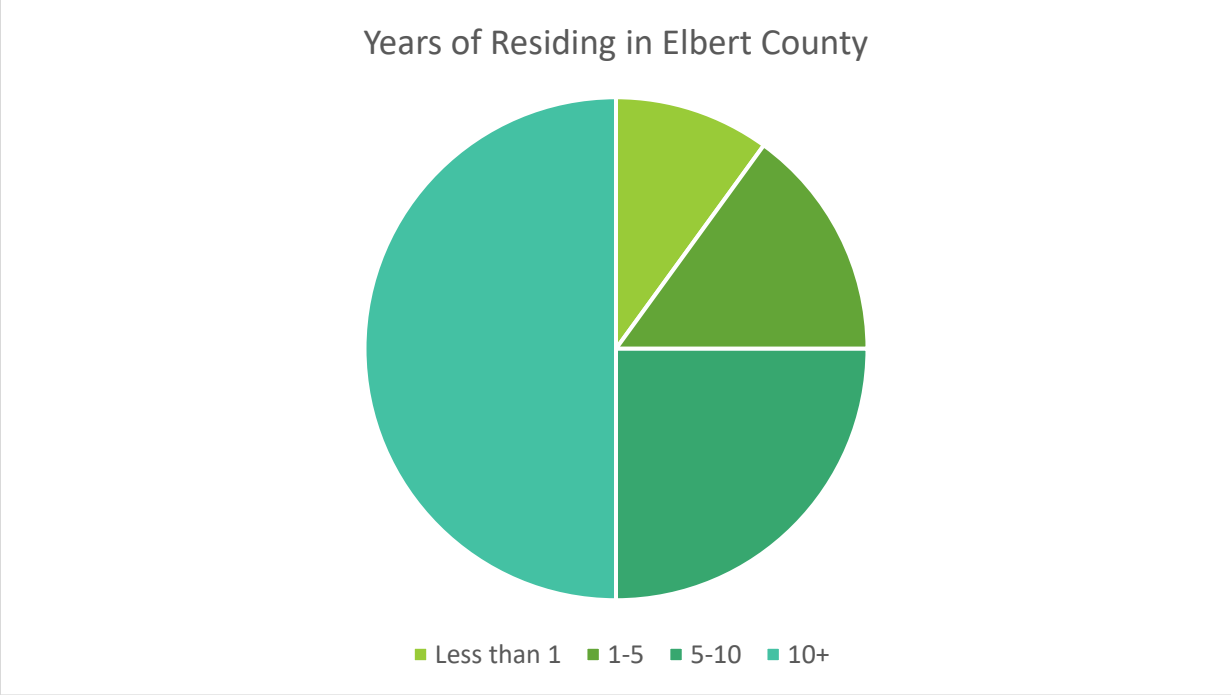

County PIO Group - Haz Mit survey share
Shane Pynes <Shane.Pynes@elbertcounty-co.gov>
To Shane Pynes
Reply
Reply All
Forward
Wed 8/3/2022 1:01 PM
2022 08 Hazard Mitigation Plan Article.docx
22 KB
Good afternoon Elbert County leadership & public information representatives,
The County is currently updating its Hazard Mitigation Plan from 2016 and is currently seeking participation on a survey from individuals across the county who either live or work here. Please consider posting this survey link on your social media channels for the benefit of our county's awareness in making informed decisions about hazard/threat preparedness.
Survey Link: https://www.menti.com/svb68hzsgr/0
Also, please consider contributing what hazards/threats you believe Elbert County is vulnerable to by taking the survey. Feel free to share the link with neighbors, friends, and family who live or work within Elbert. Below is a short narrative on the project/survey for easy social media posting and if you are interested, additional Haz Mit information is attached.
Hazard Mitigation describes actions that can help reduce or eliminate long-term risks caused by hazards, such as floods and wildfires. Residents, organizations, and businesses are encouraged to contribute to the planning process. What hazards do you think Elbert County should focus on? Take the survey NOW
Benefits of this project include ensuring eligibility for mitigation grant funding, increasing public awareness of hazards, and identifying a mitigation strategy for reducing future losses. OEM Twitter Link https://twitter.com/ElbertCountyOEM/status/1554870296468803584
Thank you for ensuring we are well informed on this topic,
Shane
Shane Pynes, MS, M.Ed
Director
Office of Emergency Management
Elbert County
shane.pynes@elbertcounty-co.gov
Mobile: 720-618-0478

2.3.1 Community Survey

The community survey was open to the public for approximately two months and received 93 responses. Over half of these community members live in unincorporated areas of Elbert County and less than 10% live outside of the county. The remaining respondents were primarily from Elizabeth, with almost a quarter of the total, while Kiowa and Simla combined filled out the rest with over 10%.

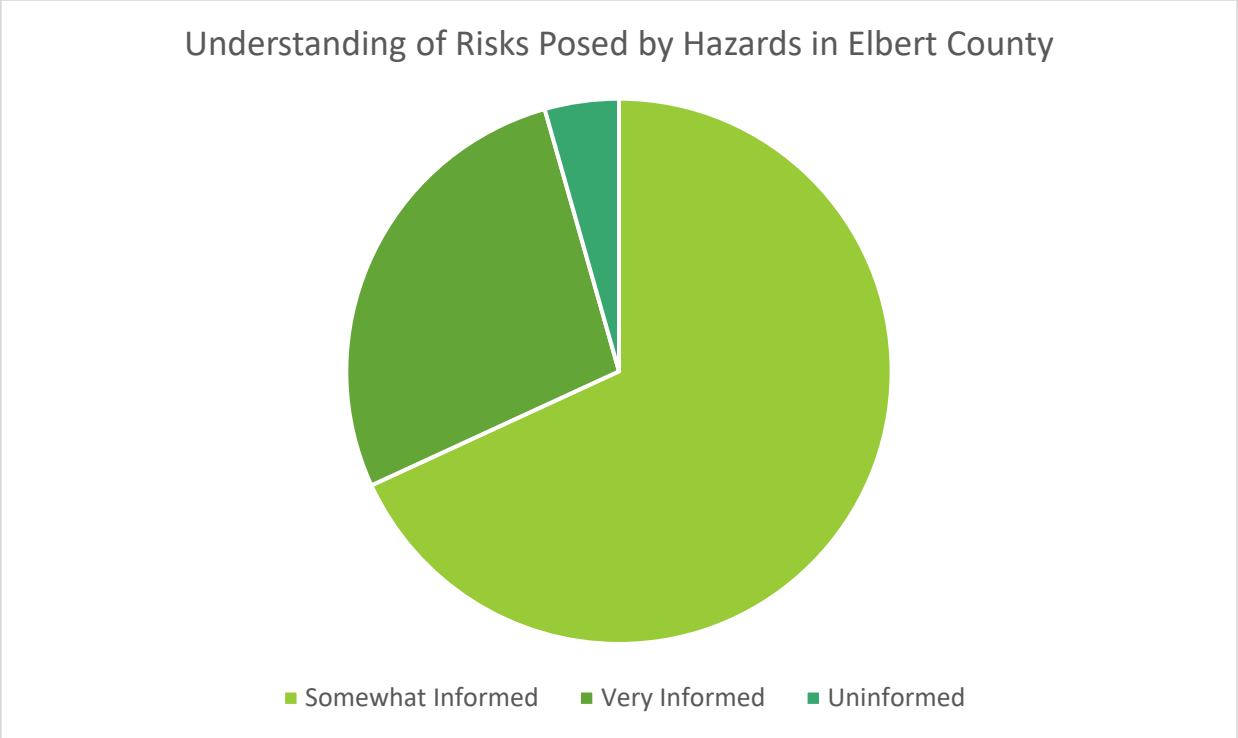
Around half of these community members have lived in their area for 10 or more years. Approximately a quarter have lived in their location for 5 to 10 years and roughly 15% have resided between 1 and 5 years. Only 10% of respondents have lived in the county less than one year.

Figure 2.10 Survey Respondent's Years of Residing in Elbert County



The vast majority, two-thirds of respondents, feel "somewhat informed" of the risks posed by hazards that can impact the county. Roughly one quarter of respondents feel "very informed" about the risks. Less than 5% percent of respondents considered themselves to be "uninformed".

Figure 2.11 Survey Respondent's Understanding of Risks Posed by Hazards in Elbert County

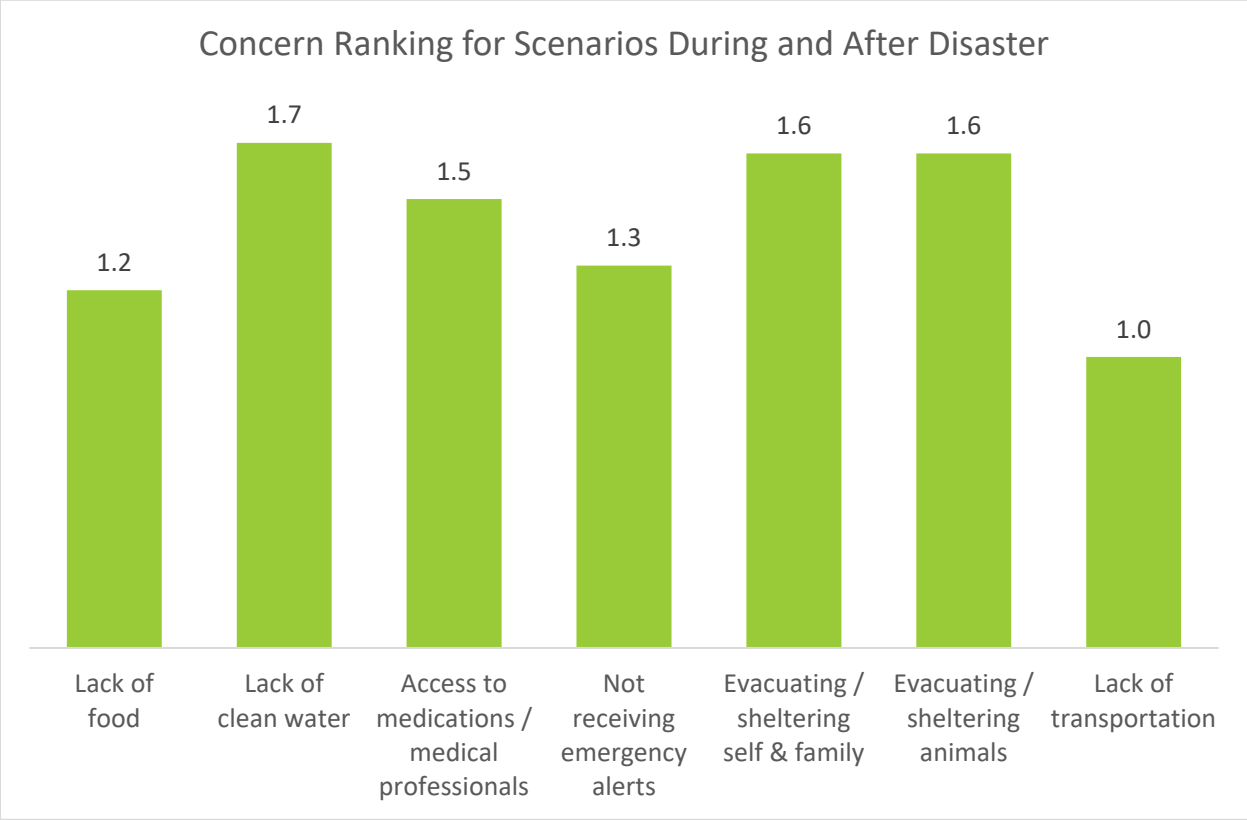


One question in the survey inquired about the number of hazard events, in the last five years, that had significantly impacted daily life for the community member. Over half of the respondents (53) answered the question, with three-quarters of these respondents reporting 1 to 2 impactful events in the last five years, approximately 20% responded with 3 to 5 impactful events, and a single respondent stated 6+ impactful events had occurred in the last 5 years.

While many in the community may not know the term "Lifelines" the survey allowed respondents to share concerns about scenarios that may occur during and following a disaster which align with the subcomponents of the Lifelines framework.

The ranking of these concerns is shown in Figure 2.12. Respondents were asked to select between least concern, a value of 1 and most concern, a value of 3 for each scenario. Lack of clean water was ranked of the highest concern, followed closely by evacuation of people and animals. Access to medications and medical professionals is the next concern based on community responses, followed by not receiving emergency alerts and lack of food. Lack of transportation is of lowest concern to the public in Elbert County.

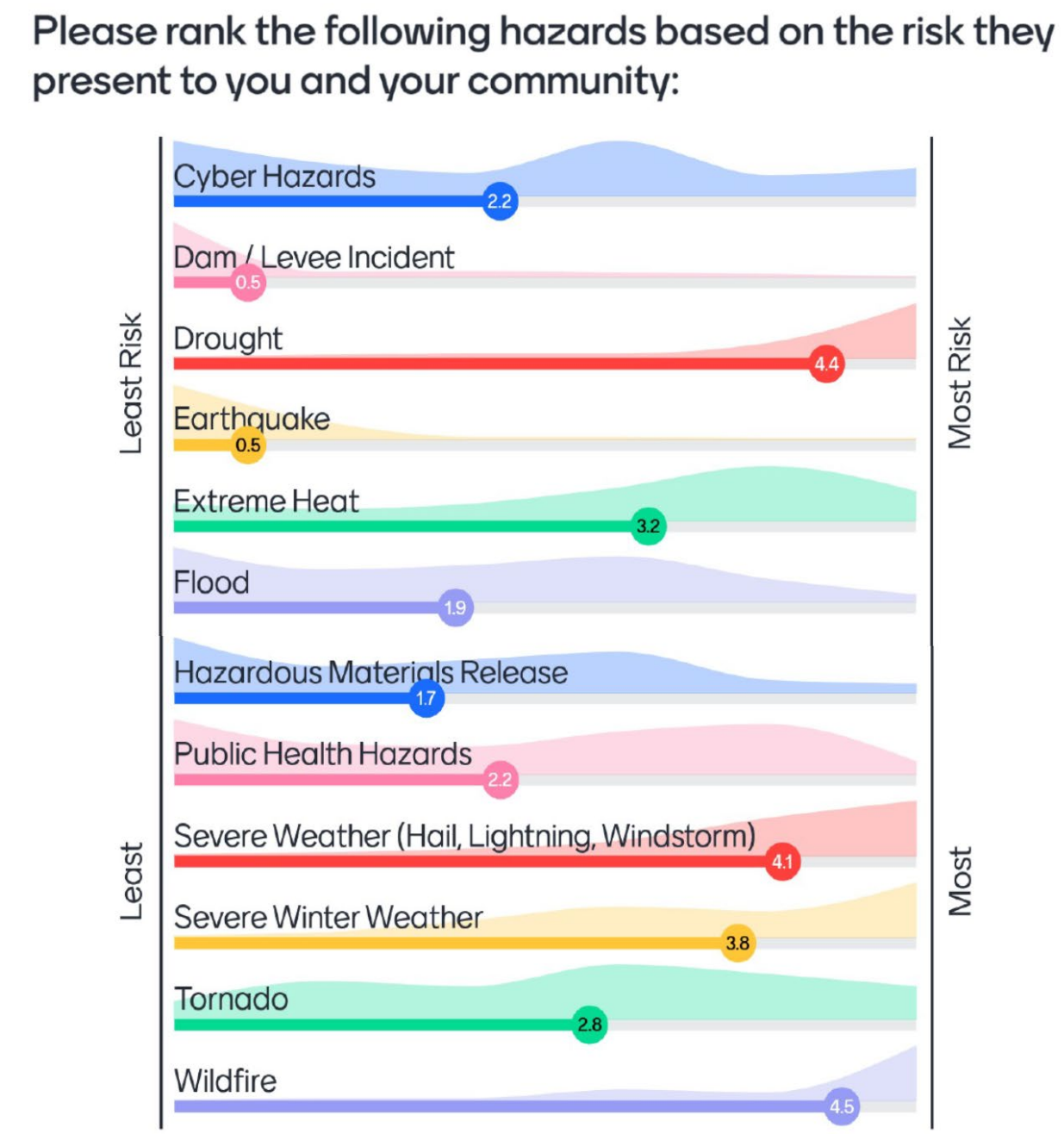
Figure 2.12 Survey Respondent's Concern for Disaster Scenarios



Recognition of the communities' familiarity with the area, understanding of the hazard risks and impacts, as well as the concerns regarding disaster event scenarios is an important foundation for planning and public outreach.

Appreciating the public's view of the risk of various hazards is the next critical piece, as it can help to inform priorities for both education and mitigation strategy. During the survey, community members were asked to rank the hazards based on risk to themselves and their community. Wildfire, drought, and severe weather (hail, lightning, windstorm) are the hazards identified as posing the most risk to community members. These are followed by severe winter weather and extreme heat. These rankings can be seen in Figure 2.13.

Figure 2.13 Public Survey Hazard Risk Ranking



Based on their experiences and input for hazard risk, the community members were asked to contribute mitigation action ideas. An example of some of these ideas can be seen in Figure 2.14 and throughout the responses there were trends in topics and ideas. These trend topics and some of the action ideas are listed below.

- Wildfire Mitigation
    - Defensible space, homeowner education and requirements for mitigation

    - Vegetation / tree removal – goat herds for removal, assistance programs such as slash pile availability and aid for those who cannot complete the work, incentives, review of the no-burn policy
- Evacuation, Sheltering, Food and Water Storage
    - Shelter identification and location dissemination prior to disaster events
    - Storage of food, medical supplies, and water at strategic locations
    - Assistance for those with difficulties evacuating
    - Pre-planning, preparedness training, "go bags"
- Communications
    - Update communications infrastructure for countywide improvements
    - Create centralized location for information, hotline
- Community
    - Support and collaborate with existing organizations
    - Utilize Elbert County's culture to create community preparedness group and volunteer forces for education and response

The ideas from the survey were also incorporated into the Mitigation Strategy Action Ideas.

Figure 2.14 Survey Respondent Mitigation Action Ideas



2.3.2 Public Review & Comment

Following development of the updated plan a public review and comment period was held. Announcements of the public review were posted widely to the county website and social media, through the county's Facebook, Nextdoor, and Twitter accounts. There were no public comments received through the online survey that was advertised along with the updated plan document.

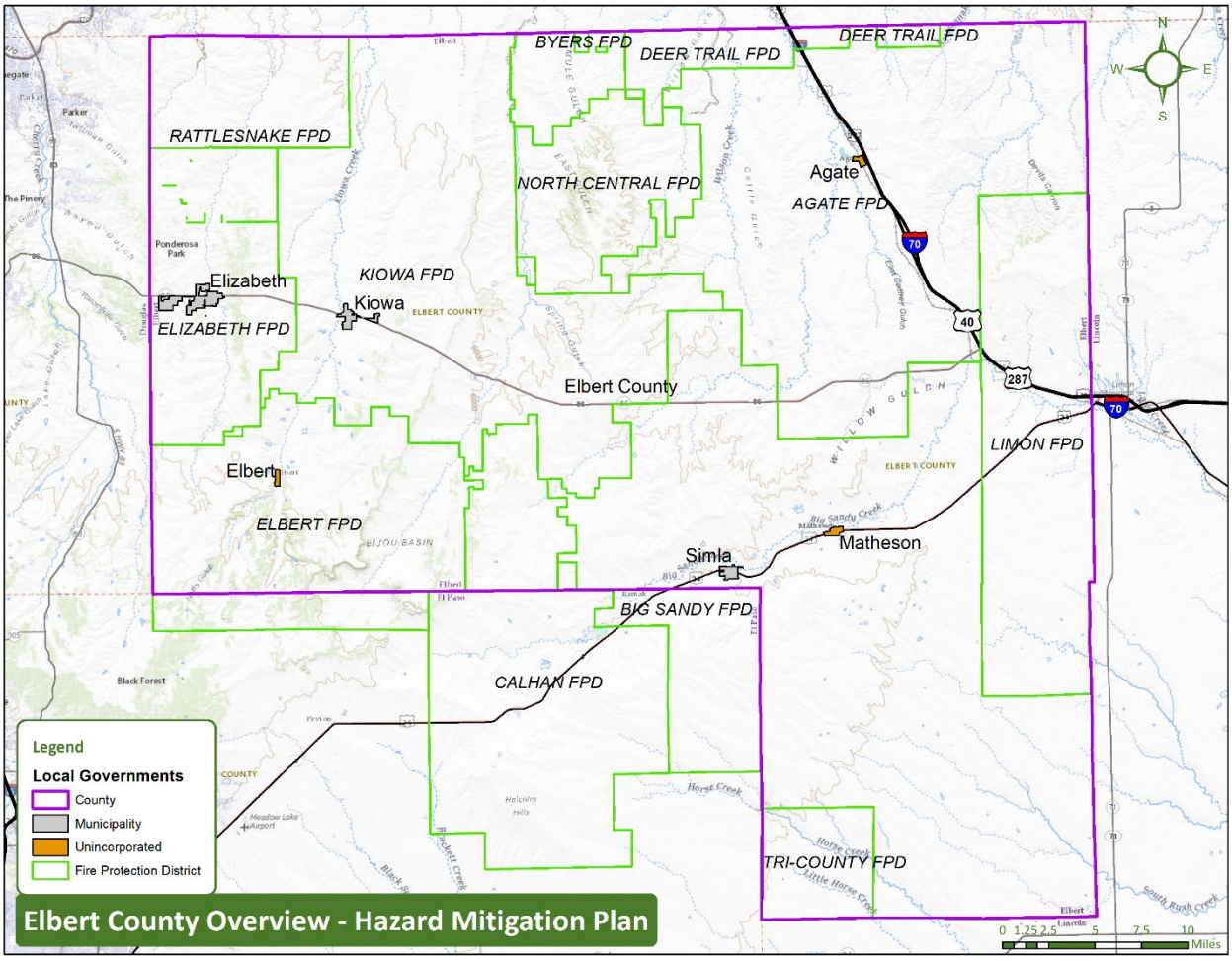
3 COUNTY PROFILE

3.1 History and Resource Overview

Elbert County was established in 1874 and finalized its boundaries in 1889. Home to multiple Native American Tribes, including the Apache, Arapahoe, and Cheyenne, the county later saw an influx of miners in search of gold. Logging, farming, cattle ranching, and dairy farming started the economic activity in the county, as camps began to grow to communities.

Kiowa is the county seat and Elizabeth is the largest town. Interstate 70 travels from Denver across the northeastern corner of the county to Limon. Colorado State Route 86 crosses the county from Castle Rock to I-70 and travels through both Elizabeth and Kiowa.

Figure 3.1 Elbert County Overview



3.2 Climate

Elbert County has a mild climate overall, with warm summers and freezing, snowy winters. According to data from the National Centers for Environmental Information (NCEI) between 1950 and 2021, the average temperature between June and September is 66°F, while the coldest months between November and March have an average temperature of 31° F.

There are extreme heat events in the county, but the maximum temperature average between June and September is 81°. The average minimum between November and March is 16° F.

The average annual precipitation in the county is 16.6 inches. Snowfall occurs between November and April typically and the annual average snowfall is 60.5 inches. Much of the heavier snowfall occurs in the higher elevations of the county.

3.3 Community Lifelines

The Community Lifelines framework was developed by FEMA to increase effectiveness in disaster operations and enable the continuous functioning of critical government, infrastructure, and business activities. In day-to-day community functions, Lifelines support the recurring needs of the community. When these Lifelines are stabilized, they safeguard the health, safety, and well-being of the public during a natural disaster occurrence.

The Lifeline categories and subcomponents are crucial to understanding the interdependence of various organizations and systems to keep a community resilient in a disaster and effective in recovery. These categories and subcomponents can be found in Figure 3.2.

Figure 3.2 Lifeline Categories and Subcomponents

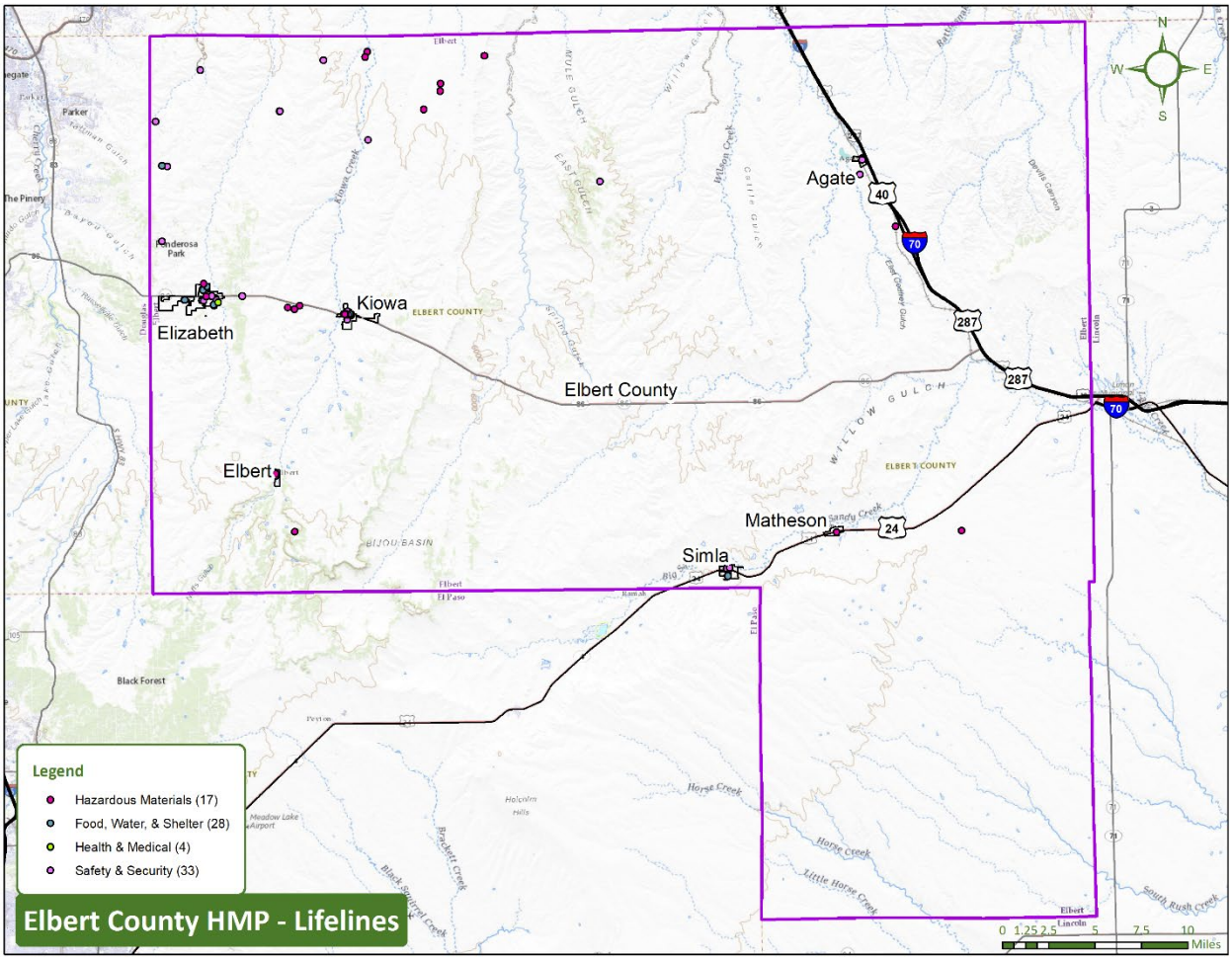


Lifelines were created to provide an outcome-based, survivor-centric framework to assist responders with determining the scale, complexity, and severity of a disaster. This information is used to establish operational priorities for the response and involves identifying the root causes and interdependencies of impacts to critical services, especially those that are life-sustaining or lifesaving.

An important component to the Lifeline framework is the ability to communicate disaster-related information across all levels of public, private, and non-profit sectors using commonly understood, plain language. This is vital to preparedness education, community engagement, and public outreach.

The inclusion of the community Lifelines construct in the HMP and its mitigation strategy is important to address critical processes and infrastructure specific to Elbert County. Identifying the Lifelines across the county creates a better understanding of effects from hazards and risks to assets. Lifeline inputs for Elbert County were derived from a previously defined set of Community Anchor Institutions (CAI) coupled with Tier II hazardous materials facilities. CAI includes governmental, nonprofit, educational, healthcare, and similar facilities. Figure 3.3 presents those Lifelines assessed as part of this HMP. Future efforts by the county are planned to further develop this GIS layer to allow for additional, refined analysis during future HMP updates.

Figure 3.3 Elbert County Lifelines



3.4 Demographics

There are numerous reasons to be aware of the demographics of communities and continue to update them during plan reviews. The HMPC brought this up specifically while discussing the risk assessment and confirmed the importance of the data being refreshed. Public health is a pertinent example of this and the county department is an invaluable partner in collecting this information, providing context in planning, and sharing community assessments.

A critical aspect of community planning is to understand expected population growth. Table 3.1 shows population estimate data from the Colorado State Demography Office. These estimates are broken into five year segments and show the potential population of Elbert County and Colorado.

The most significant growth is expected to be between 2020 and 2035, with the county adding approximately 11,000 people. There is expected to be population decrease, though very minor, between 2040 and 2050.

Table 3.1 Population Estimates for Elbert County and Colorado (2020-2050)

	2020	2025	2030	2035	2040	2045	2050
Elbert County	26,188	29,986	34,200	36,861	37,886	37,854	37,673
Colorado	5,782,915	6,110,279	6,499,600	6,853,672	7,156,825	7,389,341	7,564,742

The same data for population change estimates is presented in Table 3.2 as percentages. Between 2020 and 2030, there is projected growth of 2.7% over each five year period of the decade. This is higher than the state population growth, by 1%, between 2020 and 2025, and 1.3% higher between 2025 and 2030. The percentages for both the state and Elbert County show a pattern of declining growth, starting 2025 for the state and 2030 for the county. This pattern is steady for the state, between 0.1% and 0.2% each five year period, but the county has a dramatic decrease of 1.2% for the period of 2030 to 2035 and 1% for 2035 to 2040. The population growth for the county is estimated to become stagnant by 2040 and shows a small percentage of loss of population between 2045 and 2050.

Table 3.2 Percentage Population Change Estimates (2020-2050)

	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
Colorado	1.7%	1.4%	1.3%	1.1%	1.0%	0.8%
Elbert County	2.7%	2.7%	1.5%	0.5%	0.0%	-0.1%

Elbert County is preparing for this rapid growth and addresses this in multiple sections of the updated Elbert County Comprehensive Plan. This includes the incorporation of the hazard mitigation plan and strategy into additional plans and policies to meet the needs of expanding communities.

A snapshot of some of the demographics and health indicators for the county (Table 3.3) shows a few key characteristics including proportions of the ages of the population, disability, poverty, and chronic health conditions. The population of the county has some differences in comparison to the state's demographics; however, they are mostly minimal.

It is worth pointing out that Elbert County has approximately half the percentage of population with a disability, as compared to the state as a whole. The county also has a much lower percentage of its population experiencing poverty.

Table 3.3 Demographic Snapshot of Elbert County

Demographic	Elbert County	Colorado
Population	27,128	5,758,736
Age: 4 and Under (%)	4.5	5.8
Age: Under 18 (%)	21.2	21.9
Age: 65 and Over (%)	18.1	14.6
Persons in Poverty (%)	4.8	9.3
Persons with a Disability (%)	10.0	19.1
Persons Age 65+ with a Disability (%)	32.8	32.2
Adults who are Obese or Overweight (%)	62.0	57.4
Adults with Diabetes (%)	6.5	7.3
Adults with Asthma (%)	9.0	9.1
Adults with Coronary Heart Disease (%)	4.2	2.7

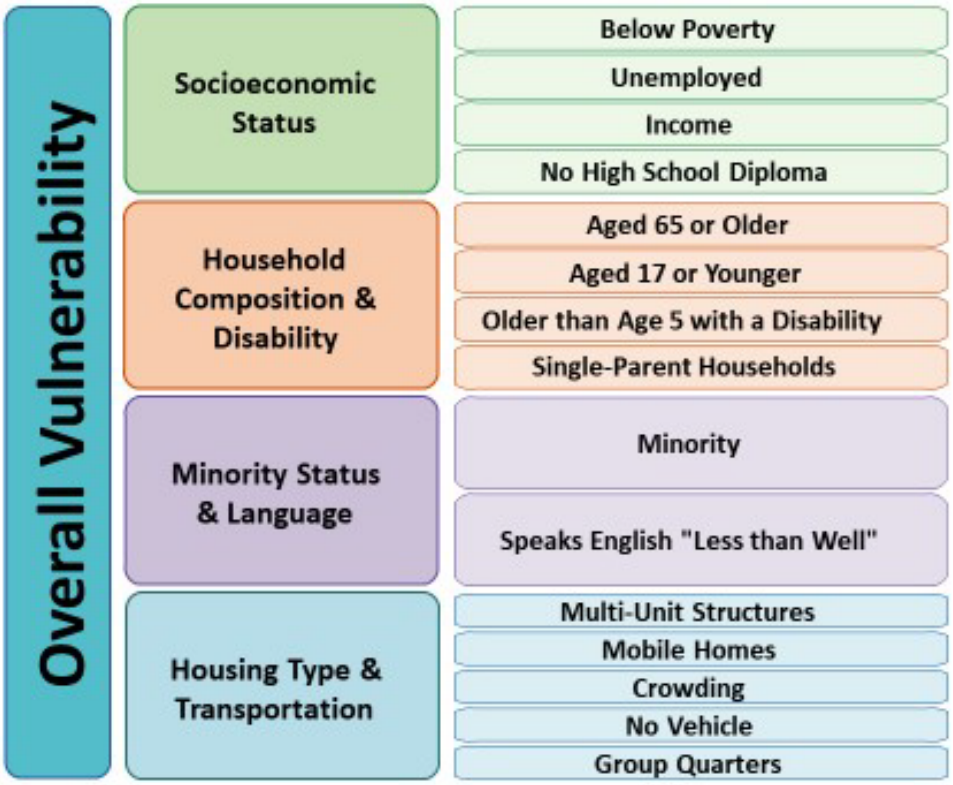
Source: US Census Bureau, Elbert County Community Health Assessment, CO Department of Public Health & Environment

3.5 Community Inclusion

Community inclusion in preparedness and response to hazards is a crucial component to the resilience of a community. This is especially important for those in the community who experience access and functional needs (AFN) during disasters. Access and functional needs are the factors which may limit a person, in an emergency situation, in their ability to communicate, maintain their health, act independently, access adequate transportation, or acquire necessary services and support. These needs encompass a variety of social and economic factors which are critical to consider when developing inclusive community plans. AFN factors are divided into four main categories: socioeconomic status, household composition & disability, language & minority status, and housing type & access to transportation. The components in these categories directly affect a community's ability to prepare for, respond to, and recover from hazard events.

Figure 3.4 from the Centers for Disease Control, illustrates the components in the categories for access and functional needs.

Figure 3.4 Community Inclusion Categories and Components

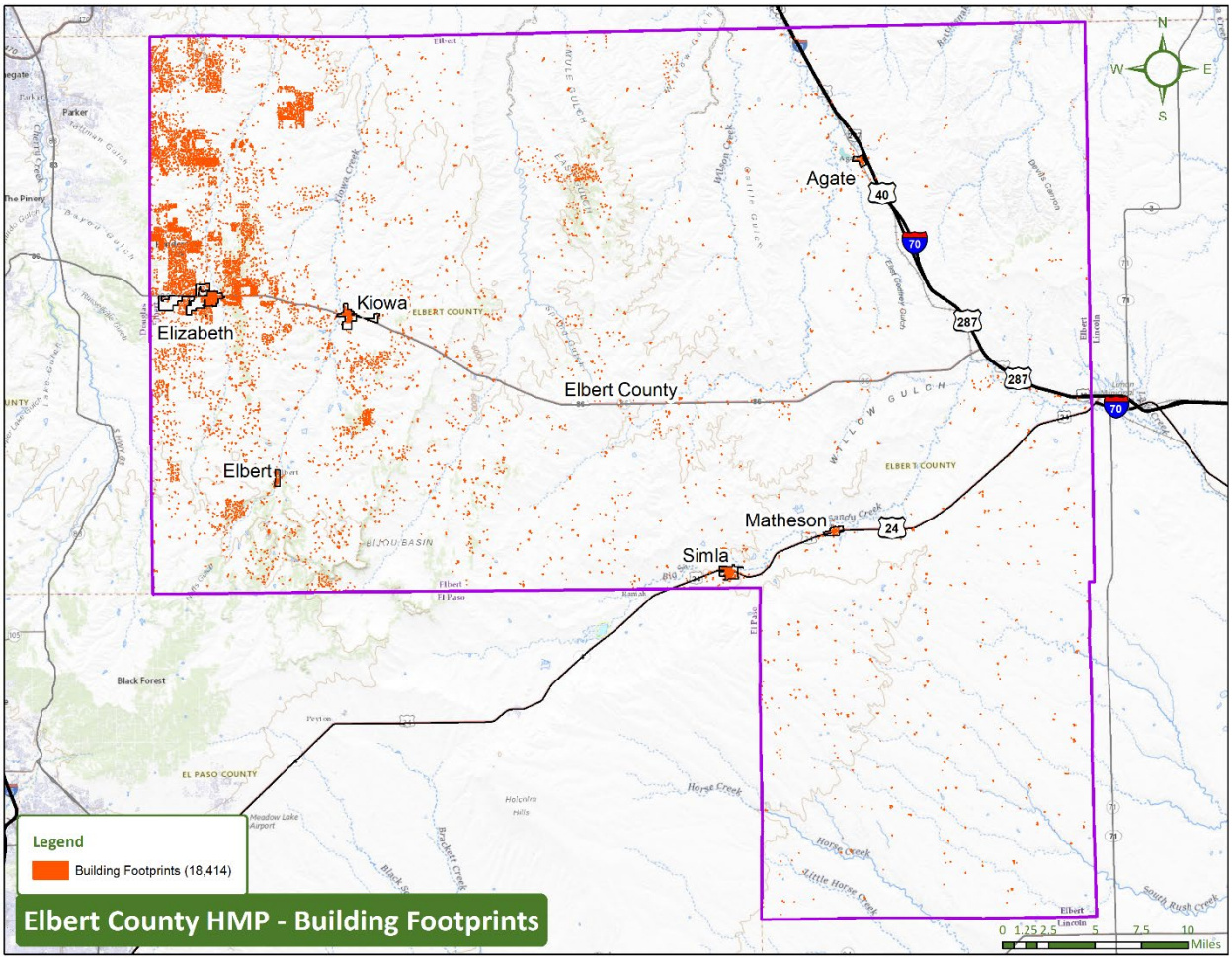


The impacts of hazards fall disproportionately on those with access and functional needs in a community, for example: low income or unemployed individuals, children, the elderly, those with disabilities, and underrepresented racial/ethnic groups. This can be seen in situations needing self-evacuation which can be unmanageable for elderly people, people with disabilities and mobility issues, those with independent living difficulty, institutionalized individuals, and those without necessary finances and means of transportation. In considering preparedness and mitigation actions, individuals and families may have limited resources to invest, their home may be a rental property, or they may not be physically capable of completing the needed actions. Social and economic factors like these have an effect on the safety of community members, decrease the ability of communities to recover from a disaster, and inhibit the building of resilience against future hazard events.

3.6 Housing

Housing density in Elbert County can be seen in Figure 3.5 which illustrates the building footprints in the county. This building footprint data, coupled with tax assessor information, was used in the risk assessment to determine the counts and values of buildings exposed to the various hazards. The majority of structures are found within the municipalities and across the northwestern portion of the county.

Figure 3.5 Elbert County Building Footprints

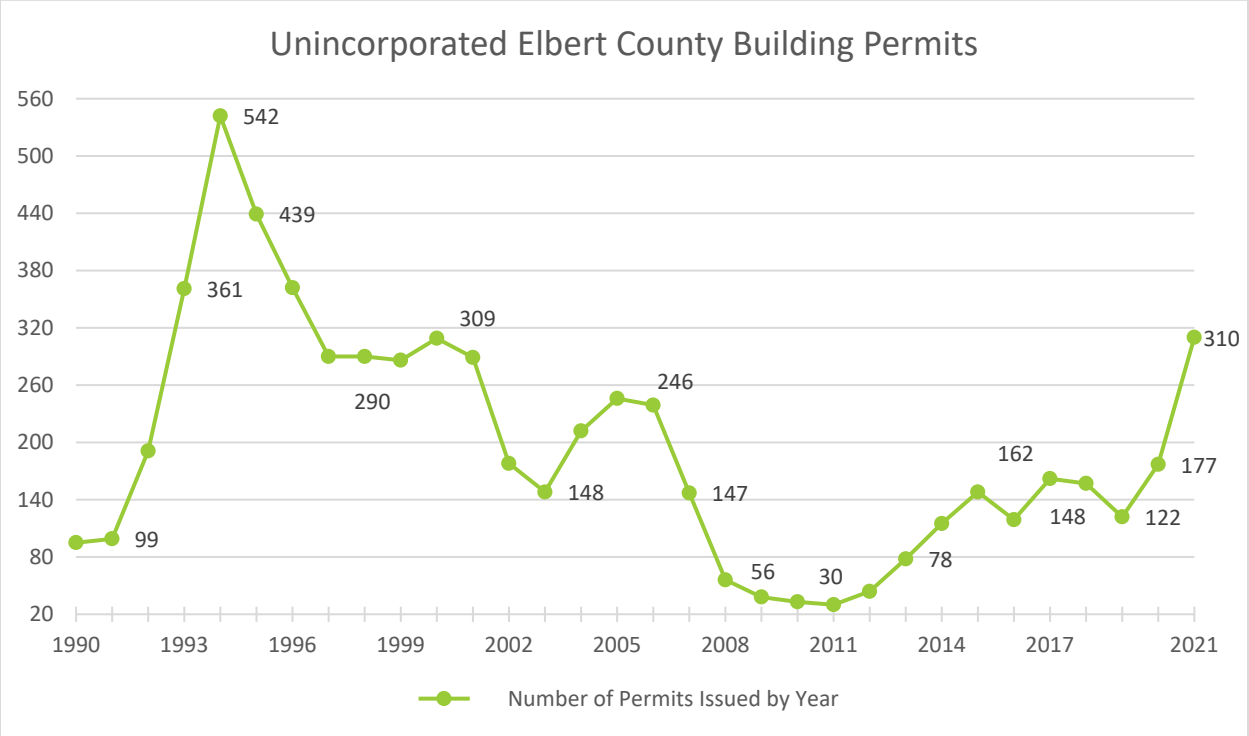


Building Permits

Building permit trends are an intuitive indicator of growth in a community. Figure 3.6 and Figure 3.7 show the trends of permits issued for unincorporated Elbert County and the Town of Elizabeth, between 1990 and 2021. There was a dramatic increase in permits issued in the mid 1990's, in both the unincorporated county and Elizabeth. This was followed by a relatively steady decline through the early 2000's. Both the county and the Town of Elizabeth have seen a rapid increase in the numbers of permits issued in the late 2010's and early 2020's.

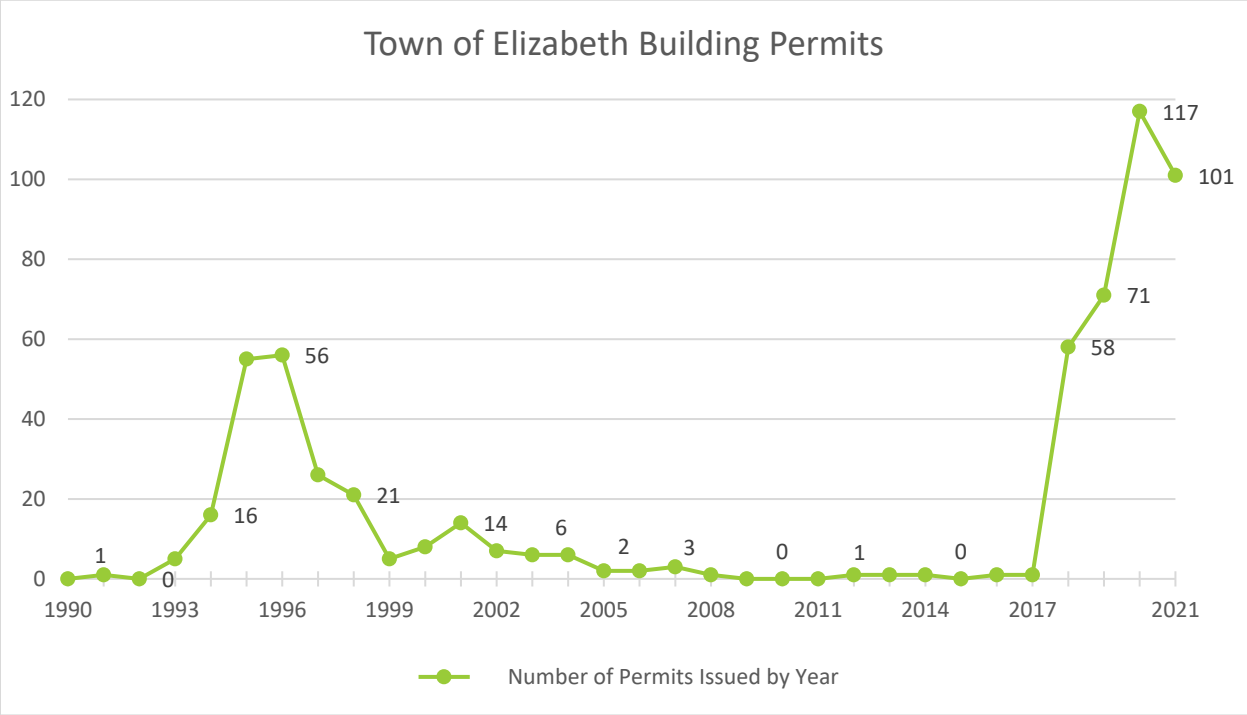
The largest number of permits issued, between 1990 and 2021, was 542 permits in 1994 in the unincorporated county, followed the next year by 439 permits. The most recent annual count of permits issued in the unincorporated areas of the county was 310 permits in 2021. The trend of increase in permits issued is likely to continue as the population growth projections in the county are considerable and construction will be needed.

Figure 3.6 Annual New, Private Housing Structure Building Permits – Unincorporated Elbert County



The largest number of permits issued for Elizabeth has only occurred recently, with a drastic increase to 117 permits issued in 2020 and almost doubling the number issued the year before. The second largest number for permits issued is 101 in 2021. This rapid increase in permits issued over the last five years aligns with the need for construction based on population growth projections for the county and Town of Elizabeth.

Figure 3.7 Annual New, Private Housing Structure Building Permits – Town of Elizabeth



The towns of Kiowa and Simla did not issue any permits for 23 and 21 years respectively, between 1990 and 2021. When permits were issued, in Kiowa less than 3 permits were issued in a year. This is similar to Simla, although in 2002 and 2003 there were 12 permits issued each year.

Housing Characteristics

Table 3.4 shows the breakdown of housing characteristics in the county as compared to the state. Overall, Elbert County aligns with most of the state figures. Outliers include renters who account for only 12% of all units occupied (almost 1/3 of the state average) and a rental vacancy rate which is five times lower that the state.

Table 3.4 Housing Characteristics

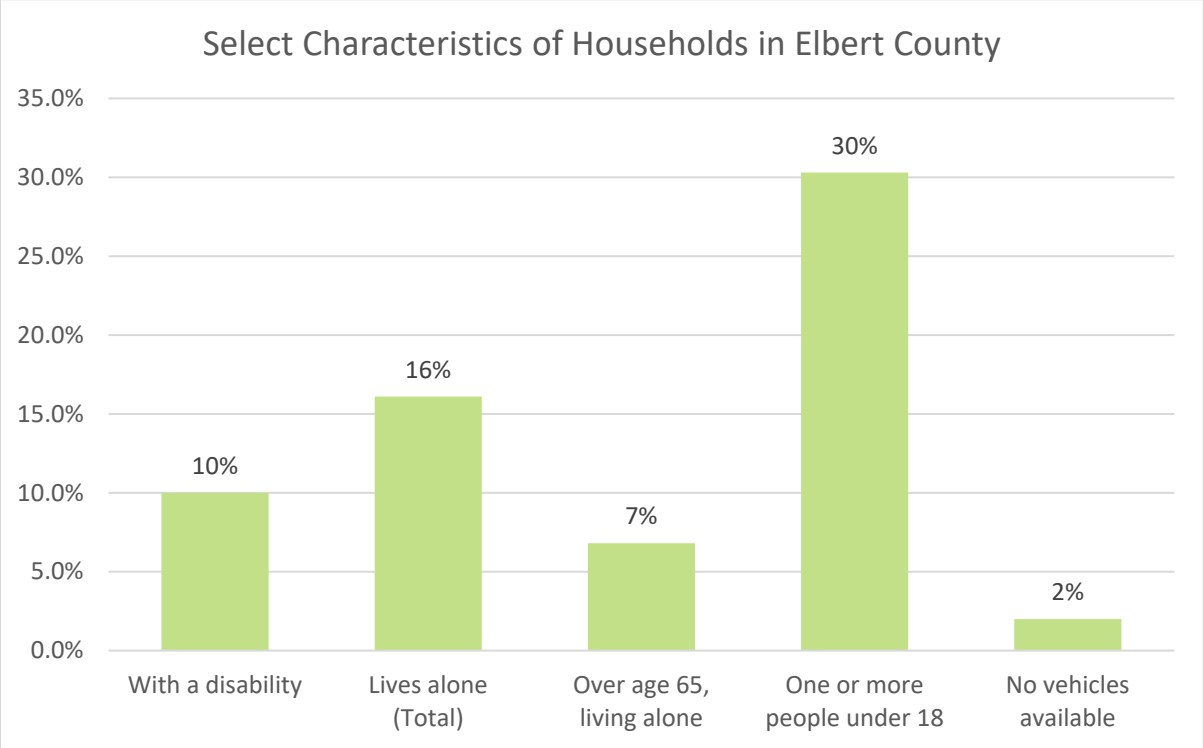
	Elbert County	Colorado
Total Housing Units	10,336	2,361,372
Occupied Housing Units	92.4%	90.5%
Renter Occupied Units	12.2%	33.8%
Rental Vacancy Rate	0.5%	4.9%
Average Household Size	2.98	2.69
Mobile Homes	3.8%	3.9%

Source: US Census Bureau, Elbert County Comprehensive Plan Update

Characteristics of the household is different than the housing itself. In discussing the household, looking at the characteristics of who resides in homes adds important context. Figure 3.8 illustrates some of these characteristics which were chosen to show potential obstacles for community members.

Those that may require access and functional needs assistance such as children, those with disabilities, those living alone, or with no transportation represent some of the most vulnerable members of the community.

Figure 3.8 Characteristics of Households in Elbert County



3.7 Economy

Jobs

According to the 2018 Elbert County Comprehensive Plan Update, job growth will be 2.88%, compared to the US at 1.59%. Future job growth in the county over the next 10 years is predicted to be 42.6%.

The plan separates population by occupation and shows the highest percentage of the population is working in Sales, Office, Administrative Support occupations (24%) with the next highest in Support Management, Business, Finance (16%) occupations.

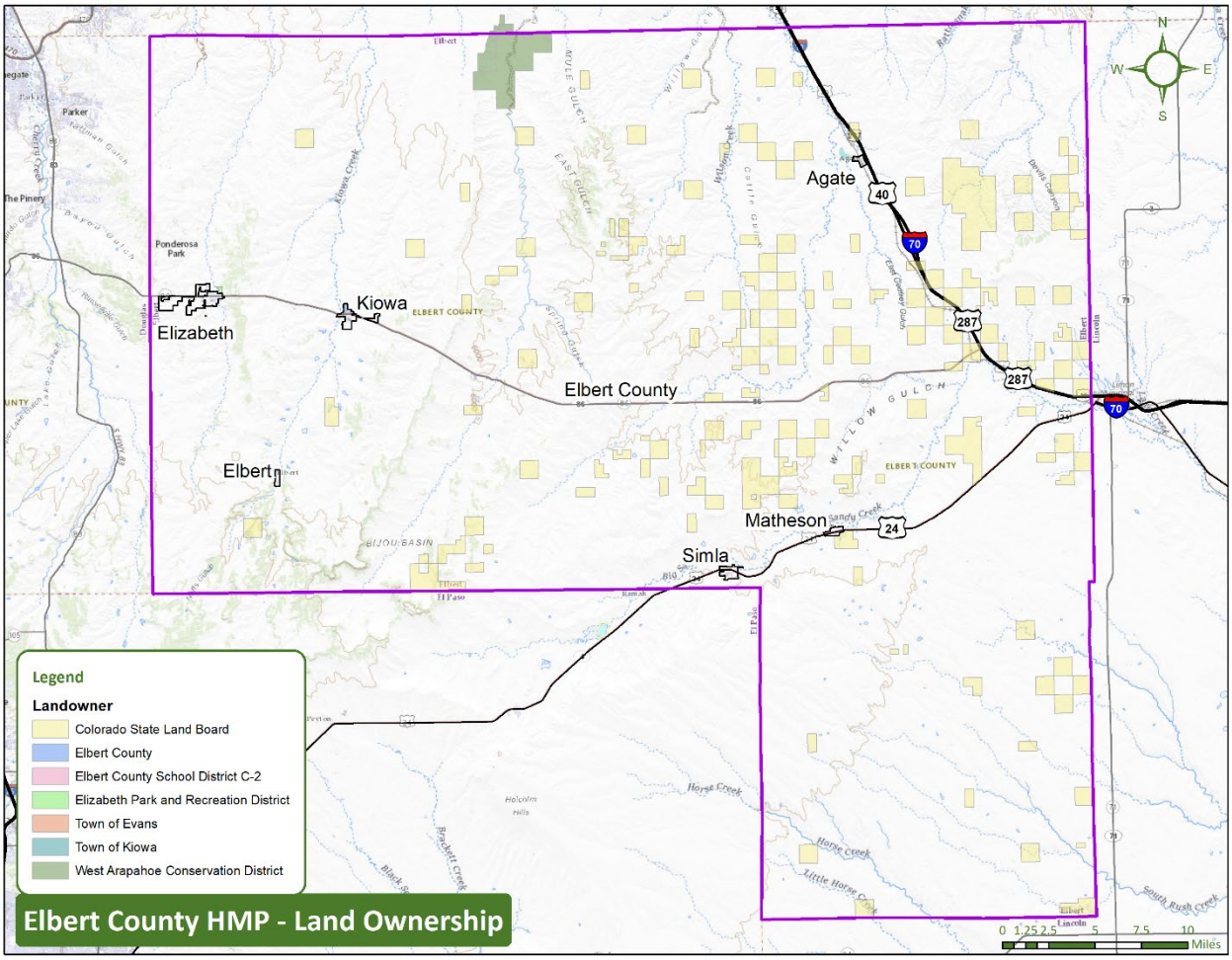
Unemployment

According to the Elbert County Comprehensive Plan Update, the unemployment rate is 3.2% which is 2% lower than the US as a whole.

3.8 Public Lands

Figure 3.9 shows the location public land ownership across the county. Colorado state lands are interspersed across the county, with a concentration along the I-70 corridor and other areas in central Elbert County. The West Arapahoe Conservation District owns land at the north border of the county.

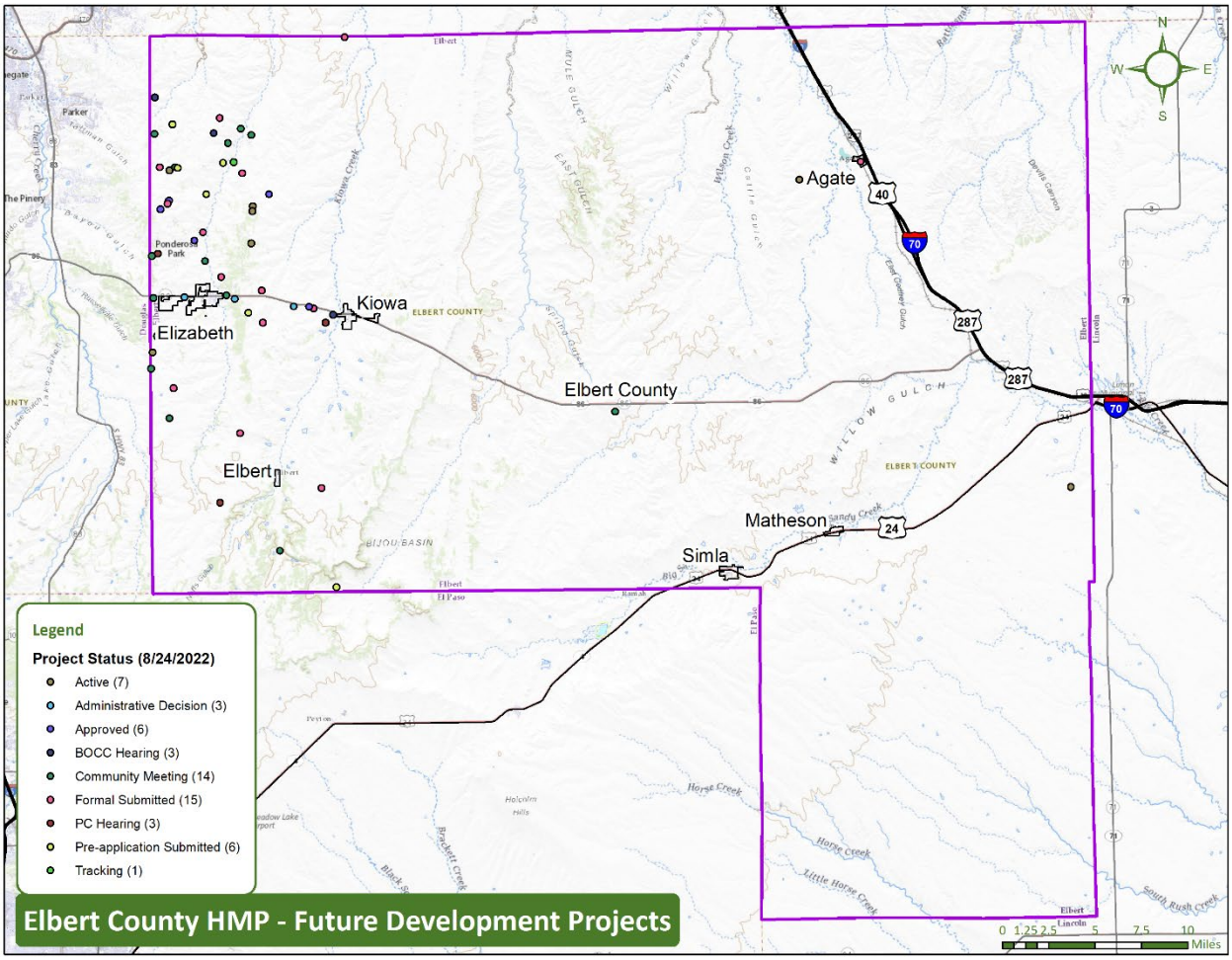
Figure 3.9 Elbert County Land Ownership



3.9 Future Development

Elbert County expects to see increased land development as a result of the projected population increases over the coming years. Figure 3.10 identifies those areas where development projects are being planned and located. It is of utmost importance that the county and municipalities ensure that development is situated outside of high hazard risk areas to avoid increasing future community vulnerabilities to hazards. Visit the Elbert County Community Development Projects webmap to view the most current development information from the county.

Figure 3.10 Elbert County Future Development Projects



4 HAZARD IDENTIFICATION AND RISK ASSESSMENT

4.1 Risk Assessment Overview

Risk assessment is the process of measuring the potential loss of life, personal injury, economic loss, and property damage that can result from natural and human-caused hazards. It allows a community to identify potential hazards and vulnerable assets. The process focuses on the following elements:

- Hazard identification – Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- Vulnerability identification – Use best available data to determine the impact of hazard events on the people, property, environment, economy, and lands of the region.
- Loss evaluation – Use best available data to estimate potential damages and losses, or costs that can be avoided through mitigation.

The risk assessment for this hazard mitigation plan (HMP) update evaluates the risk of hazards prevalent in the planning area and meets requirements of the Disaster Mitigation Act (DMA – 44 CFR, Section 201.6I(2)).

Identified Hazards of Concern

For this plan update, the hazard mitigation planning committee (HMPC) considered the full range of natural and human-caused hazards that could impact the planning area and then identified those hazards that present the greatest concern. The process incorporated review of state and local hazard planning documents, as well as information on the frequency, magnitude, and costs associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding hazards and the perceived vulnerability of the planning area's assets to them was also factored in. Based on this review, this plan addresses the following hazards of concern:

- Cyber Attack
- Dam / Levee Incident
- Drought
- Earthquake
- Extreme Heat
- Flood
- Hazardous Materials Release
- Public Health Hazards
- Severe Weather (Hail, Lightning, Windstorm)
- Severe Winter Weather
- Tornado
- Wildfire

New hazards profiled in this 2023 plan update include: Cyber Attack, Extreme Heat, Hazardous Materials, and Public Health Hazards.

The HMPC chose to omit hazards that posed minimal risk to Elbert County. The following natural hazards from the 2018 State of Colorado HMP are not included in this risk assessment.

- Animal Disease Outbreak: Does not currently warrant mitigation action.
- Avalanche: No risk identified – does not currently warrant mitigation action.
- Dense Fog: No risk identified – does not currently warrant mitigation action.
- Erosion / Deposition: Impacts (unrelated to flooding) to structures and people are negligible and mitigated through existing development policies and practices.
- Expansive Soils / Heaving Bedrock: Impacts to structures and people are negligible and mitigated through existing development policies and practices.
- Landslide / Mud-Debris Flows / Rock Fall / Rockslide: Minimal risk identified – does not currently warrant mitigation action.
- Pest Infestation: Better addressed through other community plans, mitigation not eligible for HMA funding.
- Radon / Carbon Monoxide / Methane / Other Seeps: Does not currently warrant mitigation action.
- Sinkholes / Subsidence / Abandoned Mines: No risk identified – does not currently warrant mitigation action.
- Wildlife Vehicle Collisions: Does not currently warrant mitigation action.

Hazard Profiles

The following pages provide detailed hazard profile sections for each of the 12 hazards assessed in this plan. Each profile follows the same outline and addresses the following topics:

- General background
- Past events
- Location
- Frequency
- Severity
- Warning time
- Secondary hazards
- Exposure and vulnerability
- Future trends in development
- Probability of future occurrences
- Climate change impacts

Hazard Risk Ranking

A qualitative risk ranking was performed by the HMPC and each local government for the hazards profiled in this plan. Rankings were done by the HMPC as a whole and then specific to each government. This risk ranking assesses the probability of each hazard's occurrence, as well as its likely impact on the people, property, and economy of the planning area. Through an online survey, the public was also asked to help rank each hazard based on their perceived level of risk. The HMPC and public rankings were collected using a slightly varied scale and method as compared to the local governments; however, the overall trends align with limited exceptions. The results are presented in Table 4.1.

Communities build mitigation priorities based on the risk interpretation specific to local experience. This risk interpretation is informed by multiple factors, including who is reporting the information, the scale of population potentially impacted, value of properties, and previous experiences with the hazard. These can vary greatly from one jurisdiction or district to the next and therefore are not homogeneous.

The HMPC collectively represents historical experiences with hazards in the county and multi-sector professional knowledge. This allows the HMPC to see the risk from hazards at a level encompassing all local impacts including a countywide population, numerous properties, and a regional economy.

Table 4.1 Elbert County Hazard Risk Rankings

	Cyber Hazards	Dam / Levee Incident	Drought	Earthquake	Extreme Heat	Flood	Hazardous Materials Release	Public Health Hazards	Severe Weather (Hail, Wind, Lightning)	Severe Winter Weather	Tornado	Wildfire
Elbert County HMPC	M	M	H	M	M	H	M	H	H	H	M	H
Public Survey	M	L	H	L	M	M	M	M	H	H	M	H
Elbert County	L	L	M	L	L	M	L	M	M	H	L	H
Town of Elizabeth	L	L	M	L	M	M	M	L	H	H	M	H
Town of Kiowa	M	H	M	L	M	H	M	M	M	H	L	H
Agate FDP	L	L	H	L	M	M	M	L	M	M	M	H
Big Sandy FPD	L	L	M	L	L	M	L	M	M	H	L	H
Elizabeth FPD	H	M	M	L	L	M	L	M	M	M	H	H
Kiowa FPD	L	L	L	L	L	L	M	L	M	M	M	H
North Central FPD	L	L	H	L	H	L	M	L	H	H	H	H

Exposure Analysis

Throughout this risk assessment, when data allowed, hazard exposure analysis was conducted utilizing best available GIS data compiled from local, state, and federal sources. The Lifeline exposure assessments utilize those components previously identified (Community Lifelines) and the structure exposure analysis utilized building footprint data, coupled with tax assessor information.

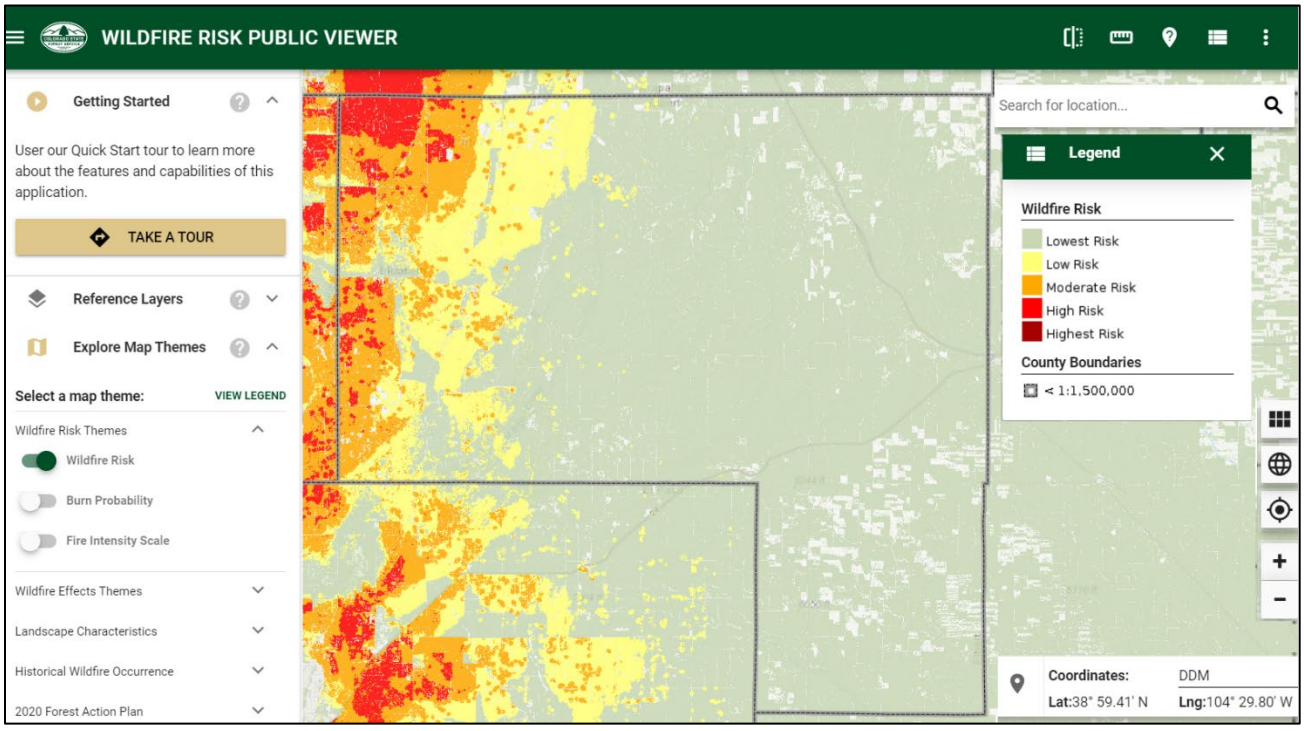
Hazard Data Viewers

The information contained in the following risk and vulnerability assessments is considered a snapshot in time, based upon the best available data during this Plan's development. It is expected that over the 5-year life of this updated HMP many of these data sets will continue to be updated and enhanced, while new data sources will become available. In order for communities to ensure they are referencing the latest and greatest hazard data, it is important that they are aware of how to access this information.

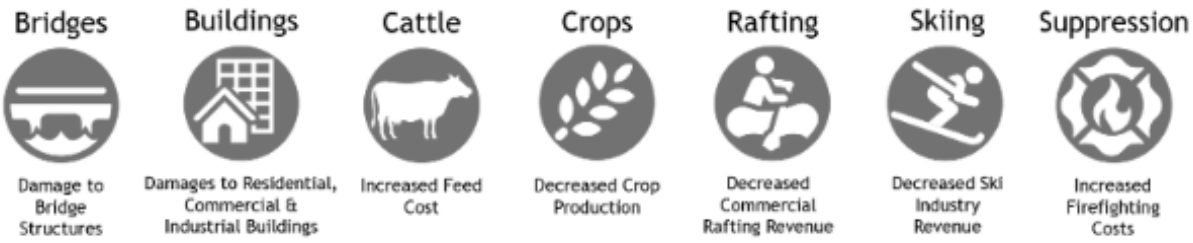
Fortunately, communities are now able to leverage state and federal web map viewers to assess the most current hazard mapping available for many of the hazards profiled in this HMP. The following bullets provide details on these currently available tools.

Colorado State Forest Service (CSFS) - Colorado Forest Atlas: Wildfire Risk Viewer. The Wildfire Risk Viewer is a web-mapping application that allows users to identify specific wildfire risk levels within a 1/2-mile radius of a home, or any other point of interest on the map. A risk level description and link to additional resources is provided for users wanting to know how to reduce their risk.

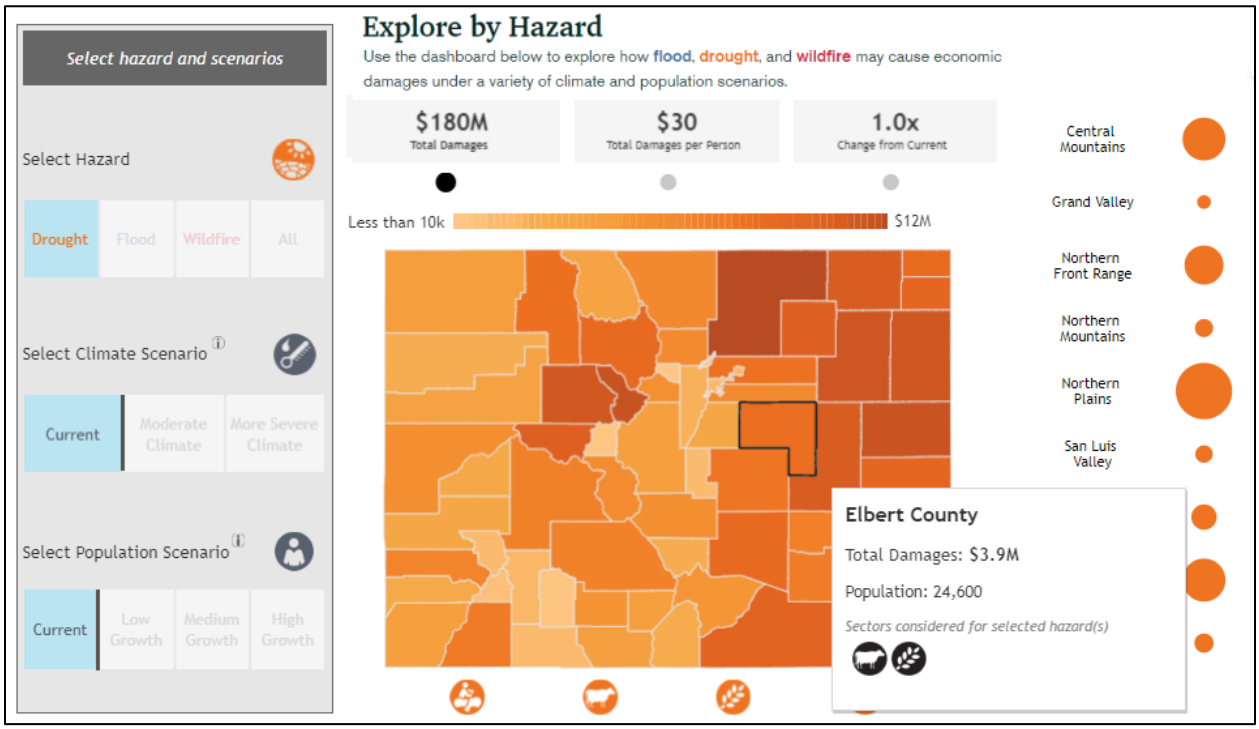
Click on the image below to explore the viewer, looking at fire intensity and burn probability, as well as risk level across Elbert County. Additional map themes include Wildland Urban Interface Risk, Landscape Characteristics, and Historical Wildfire Occurrence.



Colorado Water Conservation Board (CWCB) - Future Avoided Cost Explorer (FACE). FACE is an interactive viewer for estimating future losses from wildfire, flood, and drought across Colorado. This tool looks at a combination of hazard, population growth, and climate change data for each county and allows a user to see the expected future losses based on varying future population and climate projections. The sectors assessed within FACE and the hazard effects being evaluated are shown below.

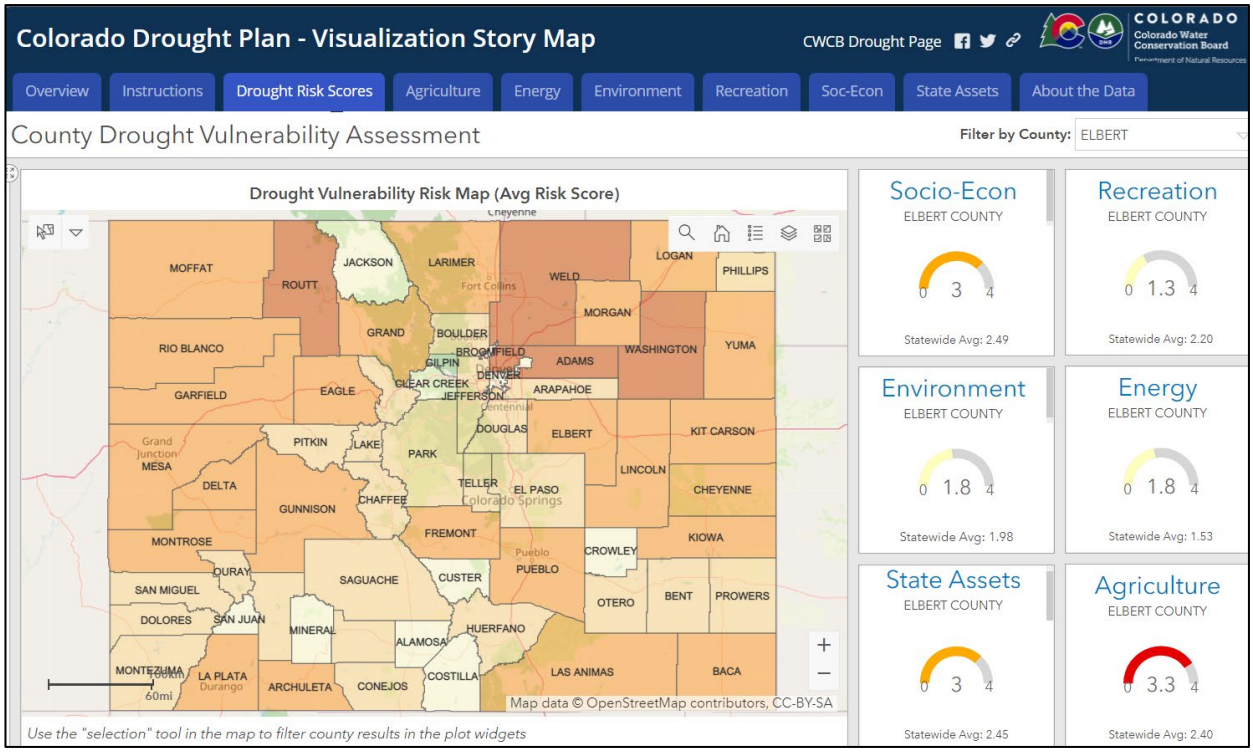


Click on the image of the FACE viewer below to see the cascading impacts of hazards, climate, and population increase across the state.



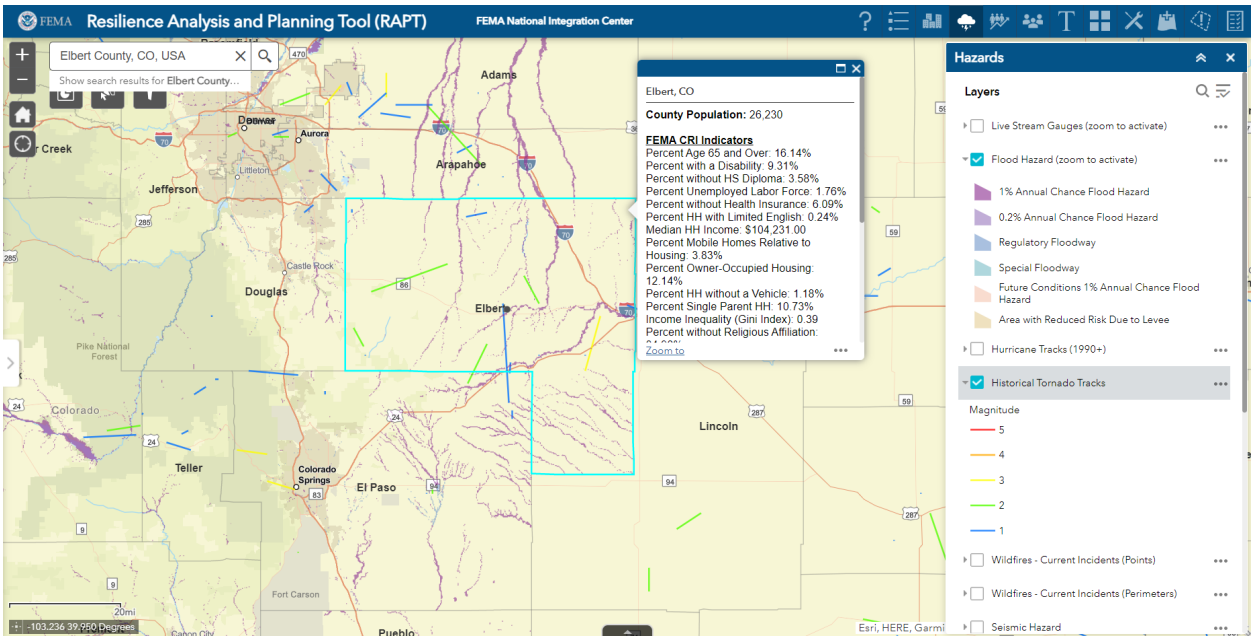
Colorado Water Conservation Board (CWCB) - Colorado Drought Plan: Visualization StoryMap. This interactive viewer presents community sector vulnerability to drought in each county. This map shows the vulnerability assessment findings in the 2018 State of Colorado Drought Mitigation and Response Plan.

Click the viewer image to gain a better understanding of the impacts of drought across sectors.



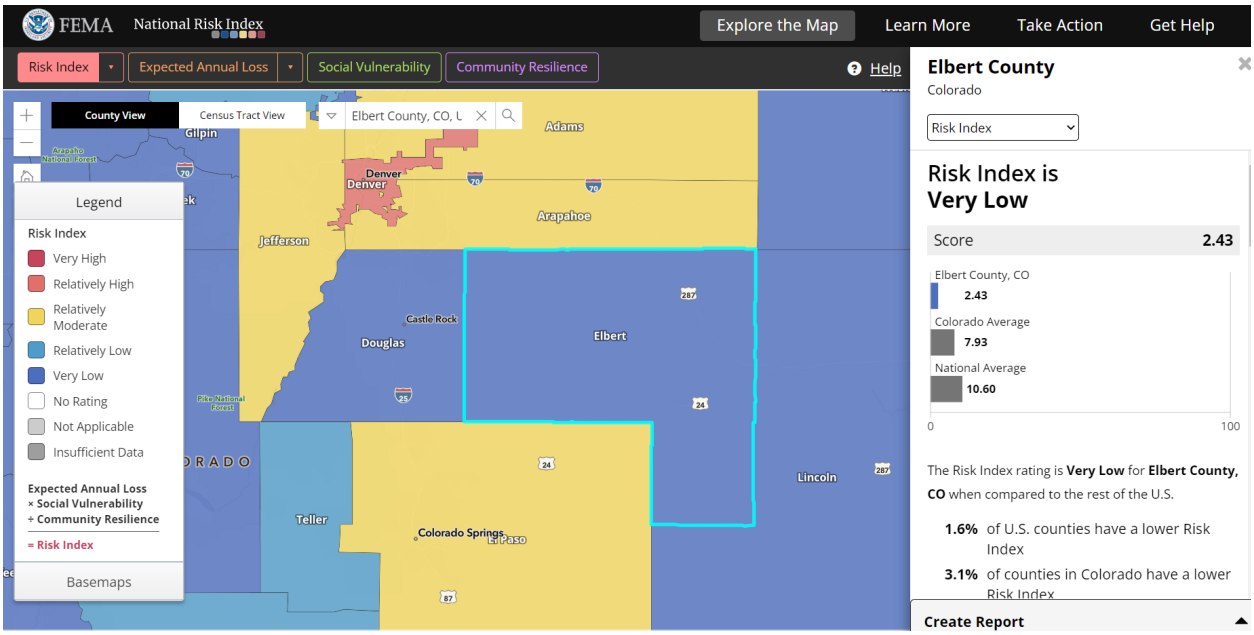
Resilience Analysis and Planning Tool (RAPT) – is a geographic information systems (GIS) tool to help emergency managers and community partners visualize and assess potential challenges to community resilience. Hazard data includes data layers of real-time radar, watch and warning notifications from the National Weather Service, live stream gauges, current wildfires, and historical hazard data for tornadoes, flood, and seismic risk.

Click on the following RAPT graphic to explore the county's hazards.



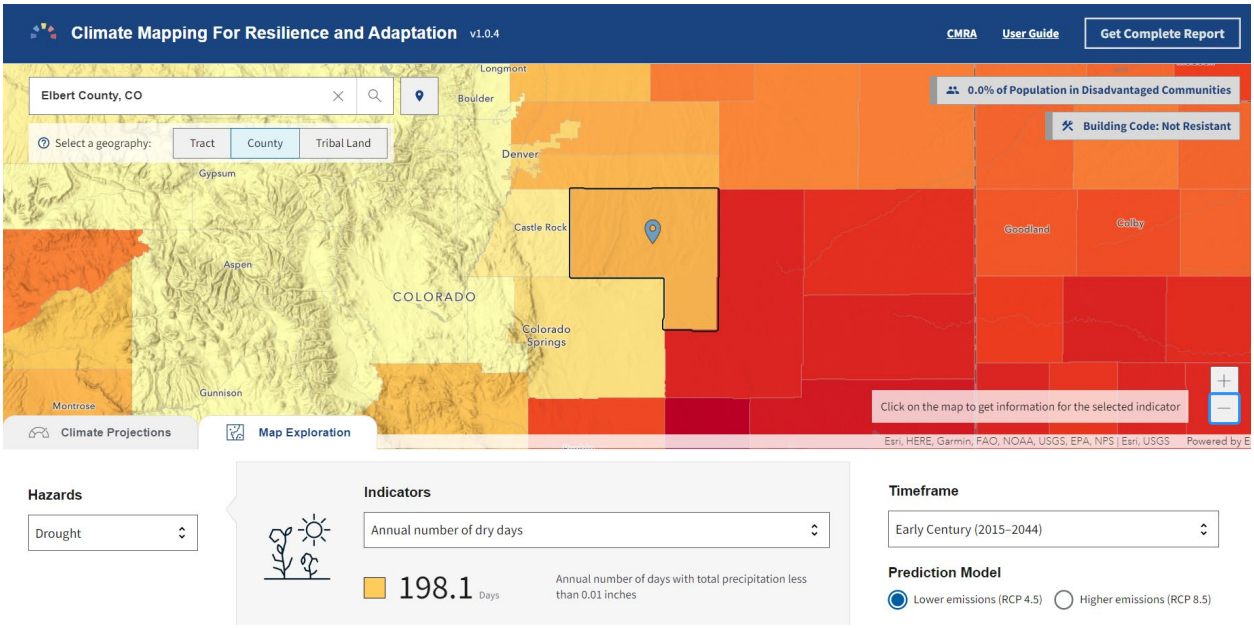
FEMA National Risk Index (NRI) – is a tool to help illustrate the communities most at risk for 18 natural hazards. The Risk Index leverages available source data for natural hazard and community risk factors. The risk equation behind the Risk Index includes three components: a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience).

Click on the NRI image to be taken to the tool.



Climate Mapping for Resilience and Adaptation (CMRA) Assessment –is a tool that provides current and future climate hazard information to assist with prioritizing, identifying, and implementing climate-informed infrastructure investments. As a single source of historical and future climate data, the tool covers exposure of multiple hazards, status of disadvantaged communities, and building codes. The information can support the planning and implementation of climate resilient projects.

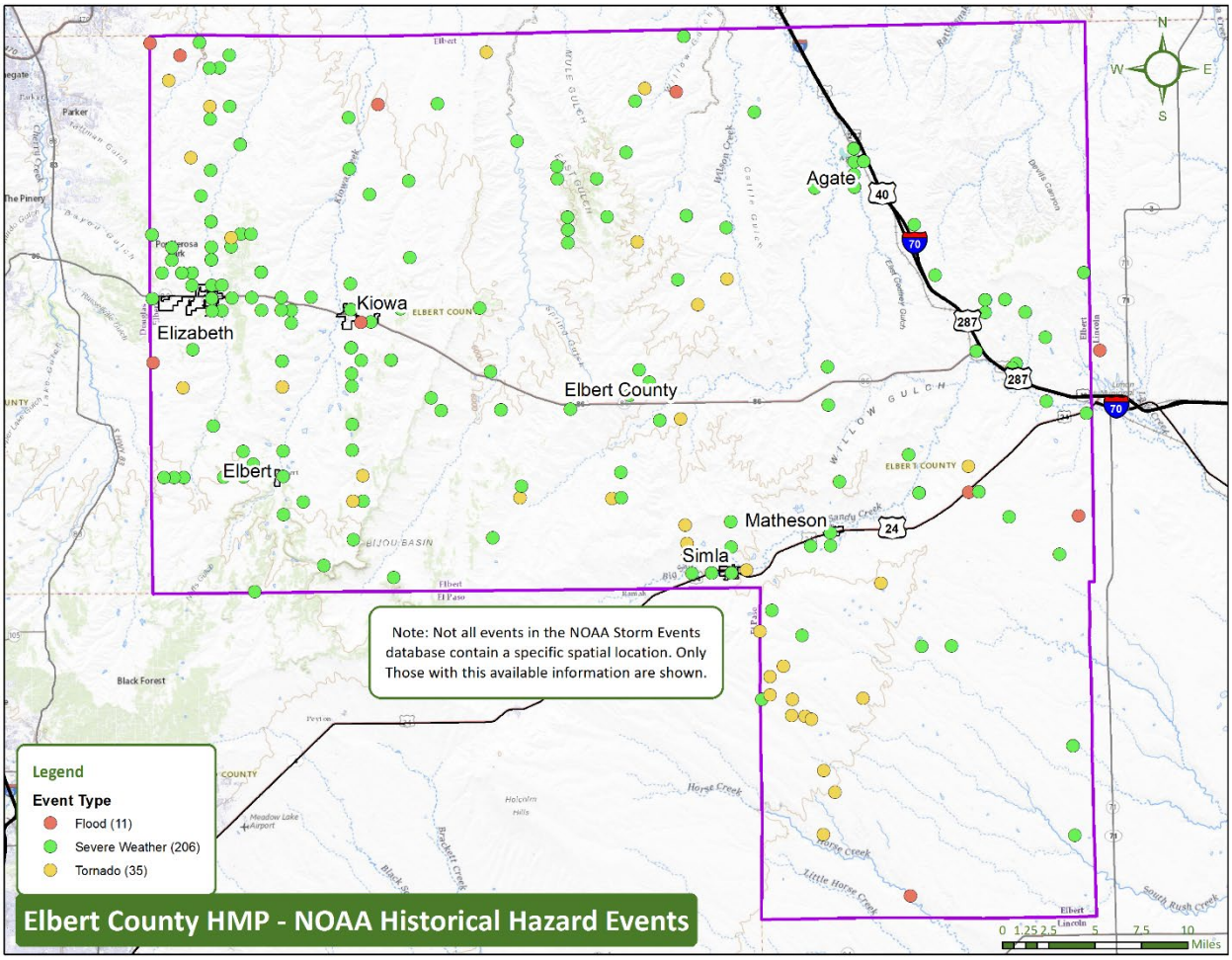
Click on the viewer image to gain insight into climate mapping.



NOAA Historical Hazard Events

Figure 4.1 shows an overview of historical hazard events reported to the National Oceanic & Atmospheric Administration (NOAA) Storm Events database, including flood, severe weather, and tornadoes. It is important to note that not all NOAA events are reported with a specific spatial location. The map shows the events for which this location data is available.

Figure 4.1 Elbert County NOAA Historical Hazard Events



4.2 Previous Disaster Declarations

Since 2003, the county has had 14 primary designations for USDA Secretarial disasters. Federal disaster declarations have occurred 11 times since 1965, with 7 of those being Major disaster designations.

Table 4.2 shows the occurrences of primary designations for Elbert County in USDA Secretarial disaster declarations. Notably Elbert County has been in drought declarations for the last 6 years, 2017-2022. These declarations and one in 2013 were all considered Fast Track declarations. A Fast Track designation process for severe drought was implemented in 2012. The process provides for a nearly automatic designation when, during the growing season, any portion of a county meets the D2 (Severe Drought) drought intensity value for eight consecutive weeks or a higher drought intensity value for any length of time as reported in the U.S. Drought Monitor.

Table 4.2 USDA Secretarial Disaster Declarations

Declaration Number	Year	Description
S5147	2022	Drought

Declaration Number	Year	Description
S4917	2021	Drought
S4703	2020	Drought
S4468	2019	Drought
S4334	2018	Drought
S4145	2017	Drought
S3456	2013	Drought, Wildfire, High Wind, Extreme Heat, Insects
S3260	2012	Drought, High Wind, Extreme Heat
S2327	2006	Wildfire, High Wind, Extreme Heat
S2329	2006	Drought, High Wind, Extreme Heat, Insects, Winter Storm
S2382	2006	Drought
S2188a	2005	Drought
S2188b	2005	Hail, High Wing, Excessive Moisture
S1797	2003	Drought

Federal disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government. A Federal disaster declaration puts federal recovery programs into motion to help disaster victims, businesses, and public entities.

Elbert County has experienced 11 events since 1965 for which Federal disaster declarations were issued by FEMA. These events are listed in Table 4.3.

Table 4.3 Federal FEMA Disaster Declarations

Declaration Number	Year	Description	Declaration Type
DR-4498-CO	2020	COVID-19 Pandemic	Major Disaster
EM-3436-CO	2020	COVID-19	Emergency Declaration
DR-4229-CO	2015	Severe Storms, Tornadoes, Flooding, Landslides, Mudslides	Major Disaster
EM-3270-CO	2007	Snow	Emergency Declaration
EM-3224-CO	2005	Hurricane Katrina	Emergency Declaration
EM-3185-CO	2003	Snow	Emergency Declaration

Declaration Number	Year	Description	Declaration Type
DR-1421-CO	2002	Wildfires	Major Disaster
DR-1276-CO	1999	Flooding	Major Disaster
DR-1186-CO	1997	Severe Storms, Heavy Rain, Flash Floods, Flooding, Mudslides	Major Disaster
EM-3025-CO	1977	Drought	Emergency Declaration
DR-385-CO	1973	Heavy Rains, Snowmelt, Flooding	Major Disaster
DR-200-CO	1965	Tornadoes, Severe Storms, Flooding	Major Disaster

Elbert County has been a designated county in 23 state disaster declarations. Approximately one third of the declarations have been for winter weather and another third declared for wildfire. Drought, flood, severe weather, and biological hazards compose the rest of the declarations. Table 4.4 shows these declarations by date and areas designated. Due to the regional nature of most of these hazards many of the declarations were statewide.

Table 4.4 State of Colorado Disaster Declarations

Year	Hazard	Location
2022	Avian Influenza	Statewide
2021	Severe Winter Weather Conditions	Statewide
2020	COVID-19	Statewide
2020	Wildfire	Statewide
2019	Severe Winter Weather, Blizzard Conditions	Hinsdale, Elbert, Douglas, El Paso Counties
2019	Severe Winter Weather, Blizzard Conditions	Larimer, Weld, Logan, Sedgwick, Phillips, Boulder, Morgan, Washington, Yuma, Clear Creek, Adams, Broomfield, Jefferson, Denver, Arapahoe, Douglas, Elbert, Lincoln, Kit Carson Counties
2018	Drought	40 counties

Year	Hazard	Location
2018	Wildfire	Statewide
2017	Wildfire	Statewide
2014	Extreme Weather	Statewide
2013	Winter Storm	Statewide
2009	Severe Blizzard	Statewide
2009	Severe Spring Snowstorm	Statewide
2006	Snow Emergencies -	December - 24 counties
2003	Snow Emergency	Statewide
2002	Wildfires	Statewide
2002	Drought	Statewide
2000	Flood	Elbert County
1999	Flooding, Landslides, Mudslides	Bent, Crowley, Custer, El Paso, Elbert, Fremont, Kiowa, Larimer, Otero, Las Animas, Pueblo, Weld Counties
1997	Flooding	Fort Collins, Weld, Morgan, Logan, Phillips, Clear Creek, Elbert, Kiowa, Baca, Otero, Lincoln, Crowley, Prowers, Sedgwick Counties; Town of Holyoke
1996	Wildfire, Drought, Severe Weather	Several Locations
1990	Blizzard	Several Locations
1987	Wildfire	Cheyenne, Lincoln, Elbert Counties

4.3 Cyber Hazards

General Background

Society is dependent on technology for day-to-day operations, and a major cyber incident could have significant and widespread impacts. Cyber hazards vary in the method of attack and area of technology targeted. Incidents are increasing and have been shown to affect a large variety of organizations, including hospitals, schools, businesses, and governments. These cyber incidents can result in the drastic slowing or halting entirely of productivity for an agency or organization. Data breach due to a cyber event is of great concern, not only for privacy reasons, but for the negative impacts that deletion or altering of data can have on future work for the organization.

Physical infrastructure damage is a potential impact from cyber hazards and the cascading effects on the virtual systems communities rely on could be devastating and long lasting. Extended power outages, fiber optic cable impairment, and other infrastructure damage or disruption would have widespread consequences for conducting everyday operations. Critical facilities and infrastructure (Community Lifelines) for water distribution and treatment, power and fuel supply delivery, as well as communications could see drastic alterations to capabilities from cyber hazards.

In many cases, it takes months, sometimes years, to restore a system to its previous functionality, perpetuating disruption even after the initial event is over. Organizations must rebuild technological infrastructure, recover lost data, and improve cyber security to ward off the possibility of another incident. The resulting cost of new equipment and manpower to rectify the situation can be prohibitive, adding up to millions of dollars separate from the payment of any ransom.

Past Events

Reporting on past events of cyber hazards presents a challenge due to a lack of data, as many organizations may choose not to report breaches to the Federal Bureau of Investigation (FBI) Cyber Division for a variety of reasons. Often, due to concerns of public perception, companies will handle the incident internally and are not required to report the situation.

However, the Cyber Incident Reporting for Critical Infrastructure Act of 2022 (CIRCIA) was recently created, to require the Cybersecurity and Infrastructure Security Agency (CISA) to develop and implement regulations, for requiring covered entities to report covered cyber incidents and ransomware payments.

The repercussions of cyber hazards to systems including local government operations, hospitals, and critical infrastructure are immense. Events are occurring across the country, including in Colorado. In 2018, the Colorado Department of Transportation (CDOT) was the recipient of two ransomware cyber attacks within two weeks which impacted the business operations. CDOT did not pay the ransom, as there was not an immediate threat to public safety (the traffic operations information is stored separately from business operations). It took a month for the systems to be restored to 80% and the state ultimately paid $1.7 million to their staff for meals, overtime, and equipment during the response.

Other large scale, national recent events include oil pipeline infrastructure shutdown, disruption of the Georgia court system, access shutdown of 22 local governments in small towns across Texas, City of Baltimore city services freeze, and the complete shutdown of a Utah county government.

A nationwide archive[1] of reported cyber incidents related to infrastructure, government, health, and education, shows that within Colorado since 2017, the following targets were attacked. There are likely more incidents that have gone unreported.

- Multiple hospitals
- Electric utility association
- Universities
- Public schools
- Water district
- Multiple public library branches
- State Attorney General's Office
- State election system
- Five counties
- Six cities and towns

Other local government attacks that have recently occurred include the City of Wheat Ridge and Fremont County. In mid-August 2022, Fremont County was the target of a ransomware cyber attack which later that month targeted Wheat Ridge. As much as $5 million was asked as ransom which the City refused to pay.

City communications were immediately affected, as servers were shut down to impede the attack. The City saw numerous offices unable to operate efficiently including the municipal court, public works, and the building, engineering, and planning divisions. Police were unable to access records or the non-emergency phone number, but emergency communications were not impacted.

The county saw similar disruptions and prioritized which departments and systems should be recovered for critical operations. Data breach is a concern, and recovering some records, in this case inmate files, proved difficult.

Both entities involved the FBI and the state of Colorado for assistance. As of the writing of this plan, over one month after the attack, county critical systems and some department operations have been restored. It is unknown when the county may be at full operational capacity.

The City has been able to restore most systems using staffers and IT consultants.

Cyber hazards can greatly affect individuals each year, as well. According to the FBI's Internet Crime Complaint Center (IC3) reported losses due to cyber crime exceeded $6.9 billion nationally in 2021, with over 840,000 victims. In 2021, Colorado ranked 14th in victim losses per state with a total of $130.6 million.

Location

Cyber hazards can impact anywhere there is technology connected to the internet. All electronics that have internet capabilities have the potential to be affected. Cyber incidents often impact victims with out-of-date hardware and are more successful, but recent events have shown even sophisticated systems can still be breached.

[1] Colorado - Cyber-Attack Archive | SecuLore

Frequency

Frequency is increasing, whether individual, organization, or government, there are more incidents reported each year. Since the understanding of frequency is based on known events, those events that go unreported could drastically increase the frequency.

Severity

Severity of cyber hazards varies tremendously. In some cases, an individual can be the victim of an incident that costs thousands of dollars, while large organizations can be expected to pay millions of dollars in ransom.

The damage aftermath to the equipment varies greatly depending on the type of attack and if there is a need to replace equipment. In many cases, it takes organizations months to be fully functional after a cyber hazard incident.

Warning Time

There is very minimal warning time for cyber hazards and that is heavily dependent on the type of cyber security in place. Most incidents begin with a program embedding over a few days before making it known the attack is happening to the user. Identifying the event and removing the link to any databases and servers is crucial in minimizing the impacts, both long and short-term.

Secondary Hazards

As more cyber hazards become apparent and are being aimed at critical infrastructure and large organizations the secondary hazards could be numerous. If an incident compromised control of a hazardous materials facility or control of dam operation for example, the effects could be detrimental and deadly.

Exposure and Vulnerability

Lifelines

The Lifeline most immediately impacted by a cyber hazard would be Communication. Society depends on a variety of technology to communicate, much of which is through the internet, servers, and computers. If a cyber incident disrupted these lines of communication, the results could be devastating depending on the target.

Energy, Safety & Security and Health & Medical may be affected depending on the intent of the attack. It is possible that critical processes could be disrupted, either by direct loss of control of infrastructure or the impacts of communication and data loss.

People

Most critically, the safety of individuals may be compromised during an attack on a hospital or healthcare facility, as being locked out of access to medical records can result in inadequate care. Hospitals have become a common target for ransomware attacks, due to the urgent nature of regaining access to data.

While large organizations that experience a cyber incident often get attention from the public and media, the majority of incidents are individual attacks on those who may not know how to protect their information. Identity theft is the most known of these individual attacks, but other types of schemes cause even greater losses to more victims.

Notably, elder fraud is a significant cyber issue with over 92,000 complaints received by the IC3 in 2021 from victims over the age of 60 with adjusted losses in excess of $1.68 billion.

Environment

The environment is not likely to be affected by a cyber hazard.

Property

Of greatest concern for property, regarding cyber hazards, is the ability for a perpetrator to control or damage infrastructure. In the case of physical interference, fiberoptic cables and other infrastructure may be disrupted or destroyed interfering with the operations of organizations and agencies.

If a person or entity were to take over the control system of a facility or business it could result in physical damages, data loss, and dangerous conditions for workers and community members. Many aspects of asset and property management are controlled through technology, from a small scale such as indoor climate conditions to the large scale delivery of power, fuel, and water to entire communities.

There have been cases of local government systems being attacked which resulted in halting and extensive delays of building permits, ownership paperwork processing, utility bill payments, and payroll delivery.

Economy

The economy of the region could be drastically affected depending on the type, duration, and motive of the attack. Prolonged lack of control to a system can result in losses for businesses and organizations. The longer an organization cannot function as usual, more money is lost, in some cases by the hour. These losses would be in addition to any ransom that may have been demanded to return control to the entity.

Future Trends in Development

Cyber hazards are likely to increase, as many organizations do not have the resources available to update and/or secure outdated systems. There are innumerable targets in each community, state, and the country and as more people use cyber hazards to harm others, there will likely be an increase in the number of incidents.

As technology continues to rapidly evolve, any new buildings and infrastructure need to be built to withstand cyber hazards. A better understanding of the technology being installed in new buildings is needed to ensure that it can be maintained and that intervention can be quick should a cyber incident occur.

Training is crucial in cyber security, as human error is the most common way for an attack to breach security. The more dependent upon technology our society becomes, the more imperative that any and all people who use electronics be educated in risks and protocols, for existing and future technologies.

Probability of Future Occurrences

Future events are likely, year over year there has been an increase in reported incidents. Considering this is only those incidents that are reported, it is feasible this rate of increase is even higher.

Climate Change Impacts

Cyber hazards are not likely to be immediately impacted by climate change.

4.4 Dam / Levee Incident

General Background

Dam incidents in the United States typically occur in one of four ways:

- Overtopping of the primary dam structure which accounts for 34% of all dam incidents, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30% of all dam incidents.
- Failure due to piping and seepage accounts for 20% of all incidents. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10% of all incidents.

The remaining 6% of U.S. dam failures are due to miscellaneous causes. Many dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage.

Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

Causes of Levee Incidents

The following information is excerpted from the 2018 State of Colorado Flood Mitigation Plan.

> A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.
>
> Earthen levees can be damaged in several ways. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters—and even large objects such as boats or barges—can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. In seismically active areas, earthquakes and ground shaking can cause a loss of soil strength, weakening a levee and possibly resulting in failure. Seismic activity can also cause levees to slide or slump, both of which can lead to failure. Unfortunately, in the rare occurrence when a levee system fails or is overtopped, severe flooding can occur due to increased elevation differences associated with levees and the increased water velocity that is created. It is also important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure. In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With

no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow. Flooding also occurs due to combined storm and sanitary sewers that cannot handle the amount of water.

Regulatory Oversight

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

Colorado Rules and Regulations for Dam Safety and Dam Construction

The Colorado Rules and Regulations for Dam Safety and Dam Construction (2-CCR 402-1, January 1, 2007) apply to any dam constructed or used to store water in Colorado. These rules apply to applications for review and approval of plans for the construction, alteration, modification, repair, enlargement, and removal of dams and reservoirs, quality assurance of construction, acceptance of construction, non-jurisdictional dams, safety inspections, owner responsibilities, emergency action plans, fees, and restriction of recreational facilities within reservoirs. Certain structures (defined in Rule 17) are exempt from these Rules. The purpose of the rules is to provide for the public safety through the Colorado Safety of Dams Program by establishing reasonable standards and to create a public record for reviewing the performance of a dam.

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. USACE has inventoried dams and surveyed each state and federal agency's capabilities, practices, and regulations regarding design, construction, operation, and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 1997).

Past Events

There are no known previous occurrences of dam or levee failure in Elbert County. Although in 2015, 25 of the dams owned by the Kiowa Conservation District were reportedly damaged. The structures experienced minor to moderate damage, but there were no failures reported.

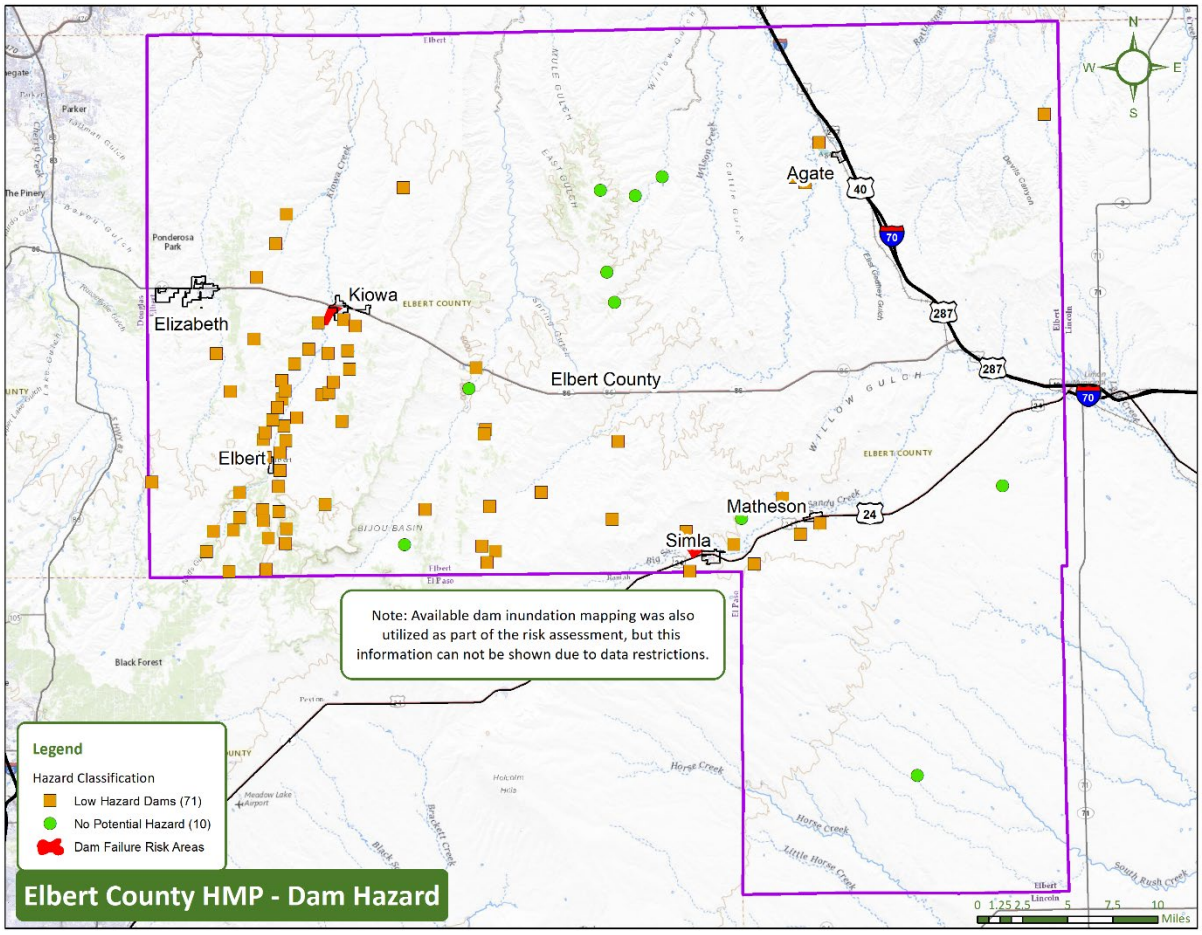
Location

According to the State of Colorado Division of Water Resources Dam Safety Branch, there are 82 jurisdictional dams in Elbert County and are all constructed of earth. All of these dams are classified as low hazard or no public hazard (NPH). There are no high or significant hazard dams in Elbert County. The Kiowa Conservation District owns approximately half of the dams in the county.

The location of 81 of the 82 dams is shown in Figure 4.2, one dam is unmapped due to lack of location data. All of the 82 dams were constructed between 1890 and 1979, with over half constructed between 1955 and 1959. In the 1950's most of these dams were constructed for agricultural purposes; however, today 70 of the 82 dams are for flood control, fire protection, and recreation. The majority of the dams are located in the Kiowa Creek drainage basin south of the Town of Kiowa. The town is downstream of most of the dams within the drainage basin.

The only known levee in Elbert County is located along Kiowa Creek to provide flood protection to the Town of Kiowa. The age, owner, and condition of the levee are unknown; neither the Town of Kiowa nor the Colorado Water Conservation Board has been able to locate any record of the levee's design and construction.

Figure 4.2 Dams Located in Elbert Count



Frequency

According to best available data, there have been no levee or dam incidents in Elbert County.

Severity

A dam hazard classification system, shown in Table 4.5, was developed by USACE for the potential consequences that could result from a dam incident. The primary concerns are loss life, economic loss (including property damage), Lifeline disruption, and environmental impact. This hazard rating system is based only on the potential consequences of a dam incident and does not take into account the probability of such events. Any dam incident that has the potential for loss of life is categorized as high hazard, regardless of any other potential impacts to property, Lifelines, and the environment. Hazard classes are not stagnant and can change depending on either development growth or decline in the area.

Table 4.5. Dam Hazard Potential Classifications

Hazard Class	Loss of Life	Property Losses	Lifeline Losses	Environmental Losses
Low	None expected	Low and generally limited to owner	No disruption of services	Minimal damage
Significant	None expected	Expected	Disruption expected	Mitigation required
High	Probable, one or more expected	Expected	Disruption expected	Mitigation required

Levee failure could result in flooding in downtown Kiowa, causing damage to structures and infrastructure. A design record or owner of the levee is unknown. The levee is not maintained and its integrity and ability to protect downtown Kiowa in a large flood event is unknown.

Warning Time

Warning time for dam or levee incidents vary depending on the cause of the event. In circumstances of extreme precipitation or massive snowmelt, evacuations can typically be planned with sufficient time. In the event of a structural failure, there may be no warning time. A dam's structural type affects warning time, as well. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted, or the breach resists further erosion. The time of breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 1997).

Secondary Hazards

Dam incidents can cause severe downstream flooding and debris flow, depending on the magnitude of the event. Spillway overtopping, as dams are designed to do, may also cause downstream flooding in areas not known to be at risk to riverine flooding.

Landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat are other potential hazards secondary to a dam incident.

A dam incident may cause contamination of drinking water and potential releases of hazard materials. The flooded area can be dangerous even after the waters recede, as extended periods of moisture in buildings can lead to mold and health impacts.

Levee incidents can lead to flooding, potentially in areas that are unexpected or not prone to flooding due to the protection that the levee provides.

Exposure and Vulnerability

All dams in Elbert County are low hazard and present minimal risk to people and property. However, since warning time may be short, loss of life is always possible from a dam incident.

The levee providing protection to the town of Kiowa on Kiowa Creek is concerning. The Town and the Colorado Water Conservation Board (CWCB) have been unable to locate any record of the design and construction, as a result the age, owner, and condition of the levee are unknown. The levee is not

maintained and its integrity and ability to protect downtown Kiowa in a large flood event may be compromised.

Lifelines

Many Lifelines can be at risk from the effects of a dam incident and resulting flooding; however, Food, Water & Shelter will see the greatest immediate impact. A reservoir that serves as the primary source of drinking water can be disrupted or halted entirely, affecting the day-to-day lives of those who rely on the source, not only those who are in close proximity downstream of the dam. An incident may displace community members which can be for a short period or an extended duration if a home is destroyed.

Other Lifelines that can be affected are Energy, Communications and Transportation. If a dam is used to generate power, the disruption of delivery to communities would impact daily operations and potentially Communications. If Communication infrastructure is damaged, the disruption or failure of communications can be dangerous for the community, as they may not receive alerts and dispatch can be interrupted. This would also greatly hinder response efforts.

Transportation damages and interruptions can interfere with evacuations and incident response, including emergency services. If Transportation and Communications are affected, the impact on the Health & Medical Lifeline can be extensive. The Hazardous Material Lifeline can be affected, as flood waters can lead to release of materials, from facilities downstream and also private properties, especially unsecured propane tanks.

In Elbert County, there is very minimal Lifeline exposure to dam inundation areas. There are only three Safety & Security entities exposed to the dam inundation areas and these are located in Simla. This represents 11% of Safety & Security Lifeline.

Table 4.6 Safety & Security Lifeline Exposure to Dam Inundation Areas

Safety & Security Lifeline	Total Count	Count Exposed	% Exposed to Risk
Simla	3	3	100%
County Total	**33**	**3**	**11%**

People

Those in the community with access and functional needs (AFN), that are downstream in dam inundation areas (or within levee protected areas), may be incapable of evacuating the area within the necessary time frame. This population includes elderly people, people with disabilities and mobility issues, those with independent living difficulty, those who are institutionalized and those without means of transportation. Non-English speaking populations are also included as communications and emergency messaging may not be available in languages other than English. In general, anyone who does not have adequate access to warnings from an emergency warning system may be disproportionately impacted by the hazard.

Environment

Dam incidents pose a great risk to the environment in the affected area. Flooding can change the local ecosystem, including permanent displacement of animals and extensive damage to vegetation. Damage to vegetation can contribute to erosion of riverbanks. Erosion can alter the waterway and push silt and debris downstream. The environment closest to the incident will likely be the most impacted; however, the repercussions of flooding can be felt much farther downstream.

Reservoirs held behind dams, and rivers held behind levees affect many ecological aspects of a river. River topography and dynamics depend on a wide range of flows and rivers below dams often experience long periods of very stable flow conditions, or saw-tooth flow patterns, caused by releases followed by no releases. Water releases from dams usually contain very little suspended sediment and this can lead to scouring of riverbeds and banks.

Property

All hazard potential classes of dams pose a risk to properties downstream. Vulnerable properties are those closest to the dam inundation or levee protected areas. Based on an evaluation of best available structure footprint data for the county, there are numerous properties within dam inundation areas. As previously noted, there are no levee protected areas currently mapped in the county.

Property damages range greatly after a dam incident, based on the severity of the water release. Structures can be completely washed away or flooded by a relatively small level of water. Any flood has the potential to render buildings uninhabitable, either permanently or for a temporary period while clean up occurs.

Agricultural lands can be damaged and roads and bridges may become impassable, potentially needing repairs.

Table 4.7 details the building footprint exposure, showing the break down by type of property and location. Kiowa has the greatest number of buildings exposed to the inundation areas and the 61 buildings exposed are primarily residential and commercial. Simla has 39 buildings exposed, over half of which are residential. Matheson has only two structures exposed, both are agricultural properties. There are a total of 5 exempt building footprints identified in the dam inundation areas which are structures that are exempt from property taxes

Table 4.7 Building Footprint Exposure to Dam Inundation Areas

	Residential	Commercial	Industrial	Agricultural	Exempt
Kiowa	34	20		3	4
Matheson				2	
Simla	21	3	6	8	1
TOTAL	**55**	**23**	**6**	**13**	**5**

Data from the Elbert County assessor was utilized to show the type and value of parcels exposed to the dam inundation area. Parcel level data may contain multiple structures, but it is possible only one structures is exposed to the inundation area. Hazard layers are not exact and therefore it can be difficult to determine exposure and value at a building footprint level. Parcel level data allows an overview of the value of parcels with exposure to the hazard layer.

The values in Table 4.8 are listed as the total actual values of parcels per the county assessor data. The residential parcels in the dam inundation areas have a value of approximately $9 million. Exempt parcels have the next highest value at approximately $7 million, followed by commercial parcels at almost $1.8 million. Industrial and agricultural parcels have a combined value of over $1 million.

Table 4.8 Value of Parcels Exposed to Dam Inundation Areas

	Residential	Commercial	Industrial	Agricultural	Exempt
Kiowa	$7,900,000	$1,700,000		$266,000	$6,750,000
Matheson				$250,000	
Simla	$1,040,000	$96,000	$330,000	$204,000	$184,000
TOTAL	**$8,940,000**	**$1,796,000**	**$330,000**	**$720,000**	**$6,900,000**

Economy

Depending on the severity of a dam incident there can be drastic effects on the individual county and regional economies, as well as financial issues for affected residents. Repairs to the dam itself can be considerable and many costs can fall to local agencies, businesses, and private owners. These costs could be extensive if the structures are not insured for floods. Any resulting damage downstream can affect daily operations for an extended period and has the potential to impact critical aspects of the economy such as recreation areas and tourist destinations.

Roads and infrastructure needed for day-to-day operations may be damaged. The transport of goods and travel across the county could be impacted, affecting the supply chain for local industry and the ability for residents to commute.

Future Trends in Development

Additional development downstream of dams in Elbert County could increase risk and possibly elevate the hazard classifications.

Elbert County expects a rapid increase in growth and it is crucial to consider the hazards posed by dams and levees when making any future development and construction decisions. Future population change projection across the county is expected to increase by 2.7% annually over the next ten years. It is important for municipalities to fully understand the risk presented by dam and levee failures to those vulnerable areas to ensure new construction does not increase the county's risk to dam / levee failure.

Inundation mapping and emergency action plans are important tools when planning for new development in at risk areas and education of the public is critical.

Probability of Future Occurrences

Unlikely: Less than 1% chance of occurrence in the next 100 years or it has a recurrence interval of greater than every 100 years

The likelihood of future events increases based on multiple factors including age, correct operation and regular maintenance, and inspections of dam infrastructure. With the added issue of severe weather events, all dams, many of which may be well maintained and functional, can potentially have more incidents, especially overtopping or spillway discharges.

Calculating probability based on past occurrences does not necessarily reflect the actual risk of future occurrence for dam and levee failure. Further information on this risk is unknown. According to the Division of Water Resources 2020 Rules and Regulations for dam safety, low hazard dams have no

requirements of the frequency of regulatory inspections; however, there is a schedule for high and significant hazard dams. Low hazard dam condition status utilizes dam owners self-reporting once every three months which is submitted to the State Engineer. This is considered the standard regulatory inspection, unless the owner notifies the State Engineer of issues or proposes alterations to the dam. Depending on the availability of reporting this may be why, in part, the HMPC has previously reported that the conditions of most small dams in the County are unknown. For local conservation districts that do not have adequate funding to monitor and maintain dams, many may be in need of repair. This increases the probability of failure during heavy precipitation or high flows.

A safety inspection results in one of three classifications of the overall conditions of dams. These classifications are:

Satisfactory	Conditionally Satisfactory	Unsatisfactory
Safety inspection indicates no conditions that appear to threaten the safety of the dam, and the dam is expected to perform satisfactorily under all design loading conditions. Most of the required monitoring is being performed	Safety inspection indicates symptoms of structural distress (seepage, evidence of minor displacements, etc.) which if conditions worsen, could lead to failure of the dam. Essential monitoring, inspection, and maintenance must be performed as a requirement for continued full storage in the reservoir.	Safety inspection indicates definite signs of structural distress (excessive seepage, cracks, slides, sinkholes, severe deterioration, etc.) which could leave to the failure of the dam if the reservoir is used to full capacity. The dam is judged unsafe for full storage of water.

Of the dams in the county, all low hazard, over 85% or 71 of the dams have been inspected by the state since 2008. Table 4.9 illustrates the most recent safety inspections by period and condition classification for the dams in Elbert County. There are 11 dams with no recent inspections recorded by the Colorado State Division of Water Resources (CWDR).

Table 4.9 Dam Safety Inspection Results

	2008-2012	2013-2014	2015-2016	2017-2020
Total Dams Inspected	15	22	18	16
Satisfactory	7	14	9	13
Conditionally Satisfactory	8	7	9	3
Unsatisfactory		1		

Climate Change Impacts

Per the 2018 Colorado State Hazard Mitigation Plan:

With a potential for increase in extreme precipitation events, climate change may result in large floods that could stress dams and levees, and thus potentially increase the risk of failure of these structures. Dams and other hydrologic containment structures are designed based on calculations of a river's flow behavior, and any changes in weather patterns can have significant effects on the hydrologic information used for the design of a dam or levee. Climate change may alter the dam/levee profile and affect the designed margin of safety. If freeboard is reduced, dam operators may be forced to release increased volumes of water to maintain the required safety parameters. Such early releases can increase flood potential downstream and possibly involve the spillway. Additionally, the structural integrity of earthfill dams may be compromised by climate change impacts such as drought and severe storms. Changes in vegetation and prolonged drying due to drought, embankment erosion due to severe storms, and more extreme fluctuations in water levels due to severe storms and increased frequency of drought all make earthfill dams vulnerable to climate change. The structural integrity of non-erodible dams or levees, such as concrete, are less vulnerable to climate change, but extreme temperatures may lead to cracking or joint movement.

4.5 Drought

General Background

Drought is a prolonged period of abnormally low rainfall, leading to a shortage of water and can last for years. Drought is a normal part of the climate cycle, but the slow-moving nature of this hazard can create detrimental losses. While drought is typically thought of as impacting vegetation and crops, there are repercussions of drought across many aspects and sectors of communities. Public water supply, energy production, public health, and wildlife are all affected by drought, as well as the potential increase of wildfires due to the lack of moisture.

The NOAA Drought Task Force Report 2020-2021 explains drought[2]:

> Drought occurs when a water deficit at the land surface ensures that water demands cannot be met. Drought is typically defined based on where water supply and its demand are being considered. For example, most droughts begin due to a period of low precipitation, creating what is known as a meteorological drought. At some point, the low precipitation can dry soils, leading to an agricultural drought. Finally, if river and stream flow is impacted, the drought can become a hydrologic drought.
>
> It is important to note three things: first, not all meteorological droughts become agricultural or hydrologic droughts. Second, agricultural or hydrologic droughts can occur without a meteorological drought such as through poor human management. Finally, the major socioeconomic impacts of droughts tend to be associated with hydrologic and agricultural droughts, as they more directly affect human-managed systems, like hydropower and agriculture.

Drought is measured in three ways: climatologic, agricultural, and hydrologic. Comparison to the norm is used in climatologic observations of precipitation and agricultural measurement compares typical soil moisture and crop conditions to the current data. Hydrologic measures water in various locations, including what is contained in snowpack, reservoirs and ground water levels, and the flow rate of moving water.

The US Drought Monitor releases data showing the areas in the country that are experiencing drought. The data classifies droughts in five categories: abnormally dry (D0), moderate (D1), severe (D2), extreme (D3) and exceptional (D4). The data is comprised of inputs from the National Drought Mitigation Center (NDMC), the US Department of Agriculture (USDA), NOAA, and the National integrated Drought Information System (NIDIS). The information provided by the US Drought Monitor is used to determine disaster declarations across the nation and identify those areas that may be eligible for federal support for losses due to drought.

There are multiple federal agencies responsible for mitigation of and response to periods of drought. NOAA and NIDIS lead the monitoring of the situation, with data inputs from the US Geological Survey (USGS) and National Aeronautics and Space Administration (NASA). The USDA leads response efforts, and the Environmental Protection Agency (EPA) regulates water quality impacts. While federal efforts are coordinated, the response efforts, planning, and water laws at the state level vary greatly.

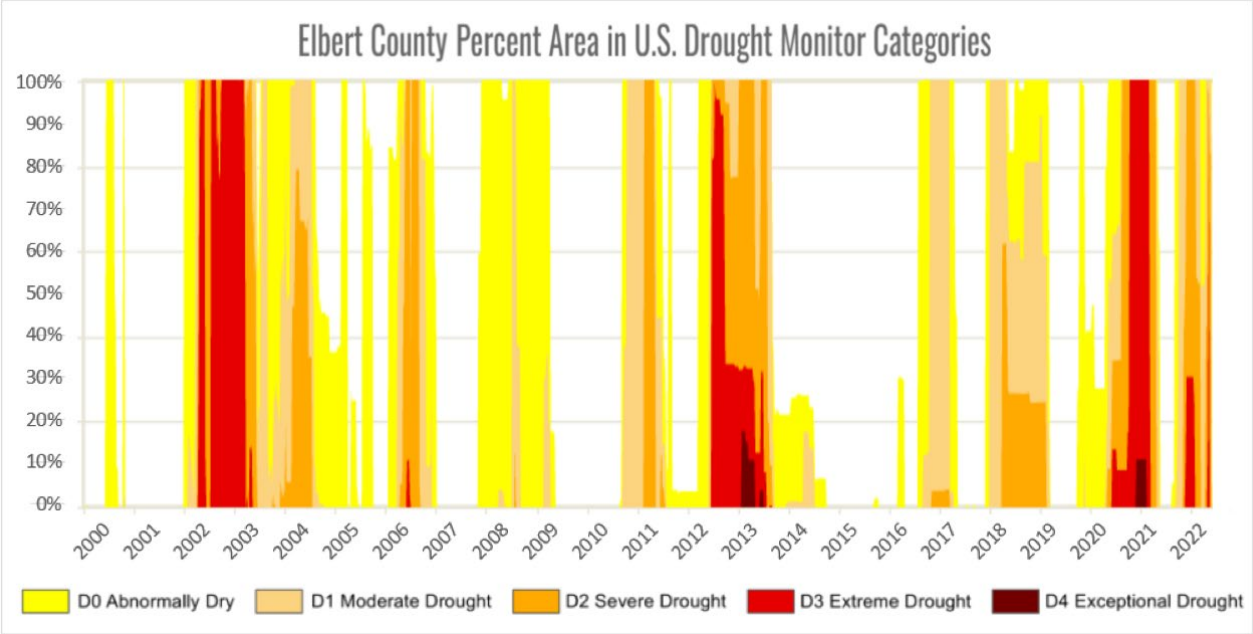
[2] Mankin JS, Simpson I, Hoell A, Fu R, Lisonbee J, Sheffield A, Barrie D. (2021) *NOAA Drought Task Force Report on the 2020–2021 Southwestern U.S. Drought.* NOAA Drought Task Force, MAPP, and NIDIS.

Since drought is specific to local geography, weather patterns, and water usage, the NDMC recommends the definition of drought be decided for each particular area and community, using local data.

Past Events

The NDMC drought data for Elbert County, between January 2000 and May 2022, is shown in Figure 4.3. This figure presents the percent of the county in drought and the category of drought throughout the time series.

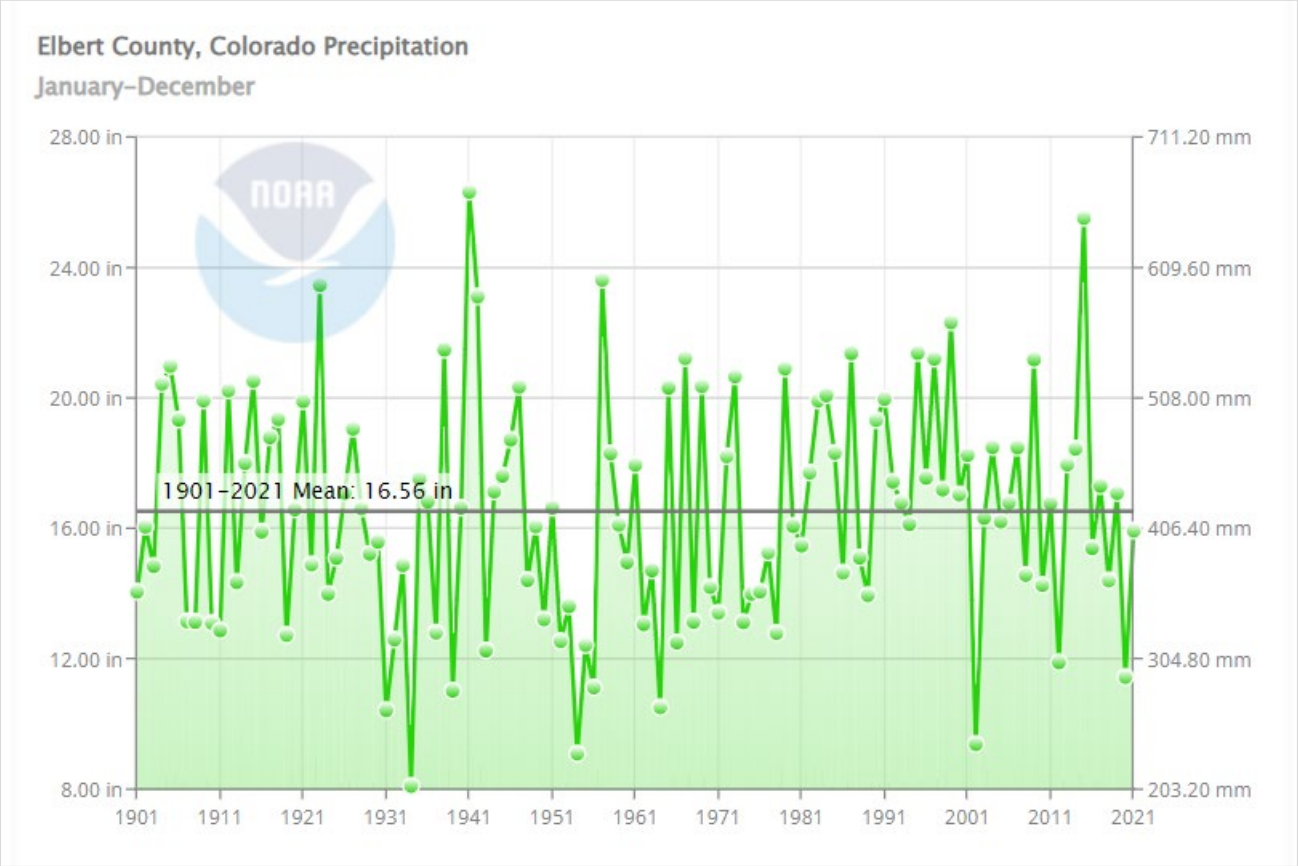
Figure 4.3 Elbert County Percent Area in Drought Categories



There have been multiple periods of extreme drought, including an almost year long period between 2002 and 2003 when 100% of the county was affected. A similar event impacting 100% of the county was recorded over the fall of 2020 into the spring of 2021. Other extreme drought periods occurred in the summer months of 2012 affecting approximately 95% of the county, as well as between fall of 2012 and spring of 2013 which saw around 30% of the county impacted. This period also included an event of exceptional drought which affected approximately 15% of the county. An additional exceptional drought period occurred in the winter of 2020, impacting approximately 10% of the county.

Figure 4.4 shows the historical precipitation for the county from 1901 to 2021. The average annual precipitation is 16.56 inches. The highest precipitation in a year was 26.35 inches in 1941 and the lowest average annual precipitation is 8.13 inches in 1934. In 2002, the average annual precipitation was 9.41 inches which correlates with the extreme drought that occurred that year.

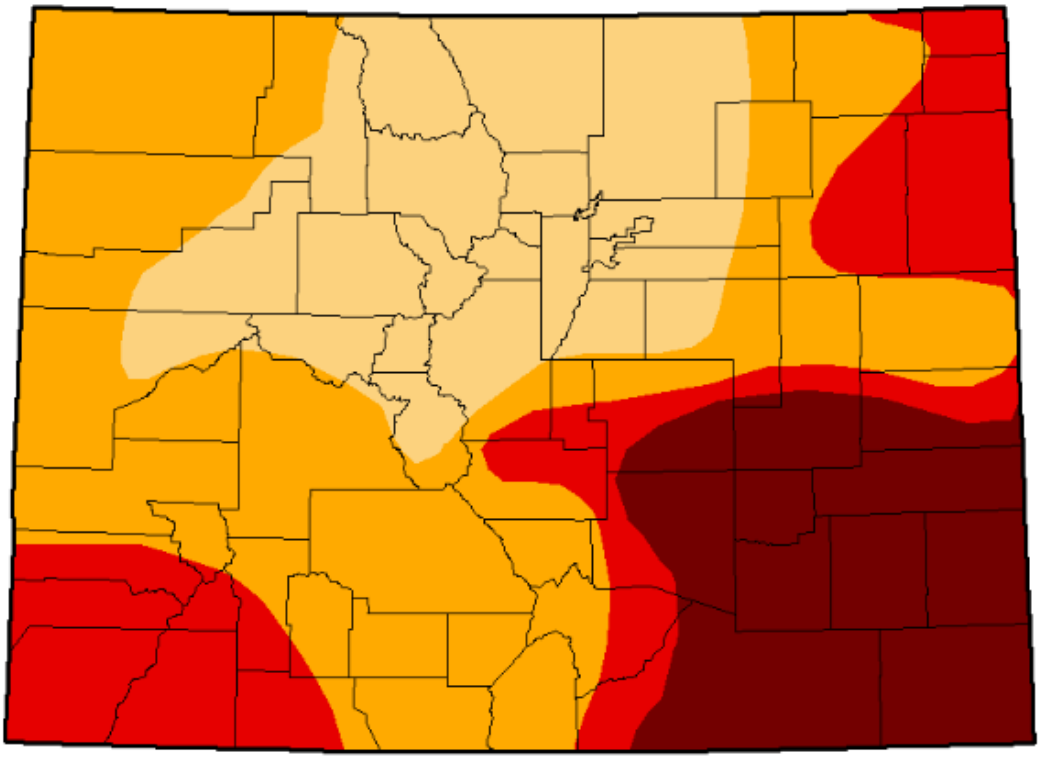
Figure 4.4 Historical Precipitation



Location

Drought is a regional phenomenon that can affect all areas of the county and participating jurisdictions with similar frequency and severity; however, this can vary across the county. Figure 4.5, from NDMC, shows the drought status of the State of Colorado for the week of June 18, 2013. This figure illustrates that various portions of Elbert County were in different drought categories, including exceptional drought in the southern portion, during the same period.

Figure 4.5 Colorado Drought Snapshot – Week of June 18, 2013



Frequency

As presented in Table 4.2 earlier in this chapter, drought reported impacts in Elbert County have resulted in USDA Secretarial Disaster Declarations during roughly 70% of the years since 2003.

Colorado is semiarid; thus, drought is a regular and natural occurrence in the state. The main source of water supply in the state is precipitation and much of this occurs in the winter as snowfall. Although drought conditions are difficult to predict, low levels of winter snowpack may act as an indicator that drought conditions are occurring.

Severity

The severity of drought depends on numerous factors including the degree of moisture deficiency, duration, and size of the affected area. Elbert County has experienced all categories of drought, including events of extreme drought lasting for extended periods.

Drought severity categories are based on the possible impacts from the event. Figure 4.6, from NDMC, details the specifics.

Figure 4.6 Drought Category Possible Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Warning Time

Only generalized warning can take place due to numerous variables. Currently, scientists are unable to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months or potentially several decades, depending on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

Secondary Hazards

Wildfire is the secondary hazard most commonly associated with drought. A prolonged lack of precipitation dries out vegetation which becomes increasingly susceptible to ignition as the duration of the drought extends. According to the State of Colorado 2018 Drought Mitigation and Response Plan, economic impacts may also occur for industries that are water intensive such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation.

Drought conditions can cause soil to compact, decreasing its ability to absorb water, making an area more susceptible to flash flooding and erosion. A drought may also increase the speed at which dead and fallen trees dry out and become more potent fuel sources for wildfires. Drought may also weaken trees in areas already affected by mountain pine beetle infestations, causing more extensive damage to trees and increasing wildfire risk, at least temporarily. An ongoing drought that severely inhibits natural plant growth cycles may impact critical wildlife habitats. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Water supplies, both for drinking water and agriculture, are at risk due to drought. Many residents in the county rely on private wells and during dry periods the aquifers that supply them are depleted. Water quality can be negatively impacted as well, according to the USGS 2021[3], research has shown that during drought periods levels of arsenic in well waters can increase.

Additionally, a reduction of electric power generation is a potential impact.

Exposure and Vulnerability

Lifelines

The Lifeline most impacted by a drought event is Food, Water & Shelter which includes Agriculture. Droughts can affect people and their livelihoods in a multitude of ways. Most critically a drought can be detrimental to the supply of drinking water and available water for agricultural use. If a drought affects agricultural yields, food scarcity can become an issue, but the bigger impact is financial, as a decimated harvest can harm the local farmers, regional economy, and influence the greater market for the crop.

The Health & Medical Lifeline can be impacted in the Public Health area, as drinking water quality and availability can quickly be affected in a drought. If availability is an issue, medical facilities may not be able to perform the necessary duties due to sanitary concerns.

People

The effects of water availability and quality on public health is the primary consideration in a drought. The immediate concern of availability of safe drinking water during the drought affects everyone in the planning area. Extreme heat that may accompany a drought can be dangerous for community members, especially for the elderly, children, those with chronic health conditions, and those who do not have a way to cool their homes.

Those with breathing difficulties may be impacted if soil is dry and strong winds occur in the area, as air quality can worsen due to dust particles.

Environment

The geographic extent of drought can be far reaching and the effects can vary greatly across the impacted areas. In the region, abnormally low precipitation over an extended period puts stress on all ecosystems. As waterways decrease in flow, fish and aquatic plants can suffer and it may be difficult to recover the populations. Vegetation acting as food for animals and important binding for soils can dry out and struggle to grow back. Animals in search of water and food may have to travel farther which can affect migration and breeding. Natural areas such as wetlands that play an important role in the overall health of the environment can be destroyed if water levels decrease. The risk of wildfires increases as

[3] Assessing the Impact of Drought on Arsenic Exposure from Private Domestic Wells 2021 (acs.org)

fuel dries out and becomes easier to ignite. Soil erosion resulting from dying vegetation can impact air quality, as strong winds pick up the dry dust.

Property

When discussing property, it is important to recognize the vast amount of investments in the agricultural industry. Between 1995 and 2020, the USDA has paid over $15 million of disaster payments in Elbert County, including $8.5 million in livestock disaster assistance and $6.5 million in crop disaster assistance. Almost $6 million of the livestock assistance was paid out in 2014, while the crop payments between 2003 and 2005 totaled over half of the crop assistance distributed.

The majority of buildings and infrastructure are typically not affected by drought as they do not depend on water for functionality or stability. However, any power infrastructure that uses water to produce electricity for communities could be greatly impacted by an extended drought. If water levels are insufficient for generating the necessary power, operations may be halted. This would affect the power service to consumers, not only those in the immediate vicinity.

Economy

The lack of precipitation caused by drought can drastically impact the economy of the county. The loss of crops and livestock due to drought has compounding and long-term consequences for the local economy.

Lack of water, for irrigation and watering livestock, can affect the quality of water that is available as higher salinity concentrations result from water level drops. The lack of water availability will increase costs further limiting the value of the products.

Productivity of crop lands is reduced by drought which decreases yield, and results in crops of lower quality. The income loss for farmers due to a devastated harvest can be felt by the local and regional economies and can last an extended period depending on the length of the drought and possibility of recovery.

Future Trends in Development

Underground aquifers are the sole source of water in the county and drought can drastically impact the population. Leadership has an obligation to the county and communities to mitigate against drought and foster resilience in water management. Developing water management infrastructure, policies, building codes, and public education can help to ensure that drought has a lessened effect as development continues. Addressing the pertinent issues during the development stage can help to avoid stressing the water supply unnecessarily, as Elbert County expects considerable growth in the future.

Probability of Future Occurrences

The occurrences of drought in Elbert County are an example of the hazard's cyclical nature. While drought duration and severity cannot be easily predicted, the pattern of an extreme drought occurring approximately every 10 years, shown in Figure 4.3, is worth noting.

Drought will occur within the county in the future based on the data which shows in the last 22 years, there have been only 4 years without a drought event. Elbert County experienced drought events during 82% of the past two-decade period.

Climate Change Impacts

Future climate scenarios suggest that several factors will lead to more frequent and more intense droughts in Colorado. These variables include a warmer and drier climate, less snowpack, lower streamflow amounts, and less surface water availability. These impacts will strain the water resource needs of Elbert County and stress people, agriculture, and ecosystems. Increased drought will likely lead to increased risk from wildfire and insect outbreaks.

4.6 Earthquake

General Background

An earthquake is the vibration of the earth's surface following a release of energy in the earth's crust. This energy can be generated by a sudden dislocation of the crust or by a volcanic eruption. Most destructive quakes are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

Earthquakes tend to reoccur along faults which are zones of weakness in the crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

Geologists classify faults by their relative hazards. Active faults which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years). Potentially active faults are those that displaced layers of rock from the Quaternary period (the last 1,800,000 years). Determining if a fault is "active" or "potentially active" depends on geologic evidence which may not be available for every fault.

Faults are more likely to produce earthquakes if they have more rapid rates of movement, have had recent earthquakes along them, experience greater total displacements, and are aligned so that movement can relieve accumulating tectonic stresses. A direct relationship exists between a fault's length, location, and its ability to generate damaging ground motion at a given site.

Liquefaction

Liquefaction occurs when loose sediment that is saturated by water temporarily loses strength in response to ground shaking and acts as a fluid. When liquefaction occurs, buildings and cars can sink into the ground, slopes fail, buried tanks and pipes can rise to ground level, and lateral spreading can occur. Lateral spreading is when level ground shifts laterally, sometimes for tens of feet.

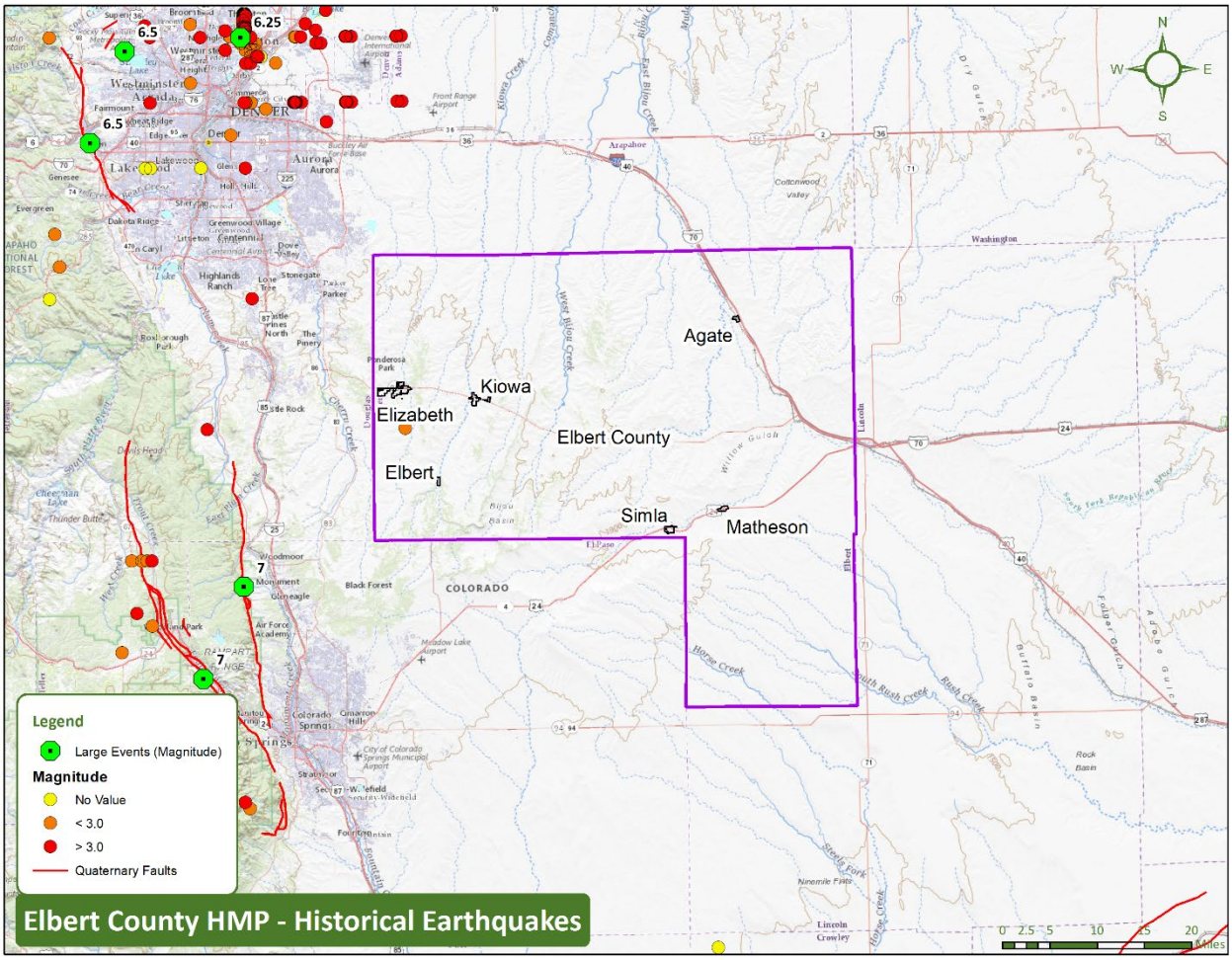
The liquified material can force open ground cracks to release to the surface and can cause debris flows or flooding. Factors for whether liquefaction will occur include the degree of saturation, the grain size distribution and consistency of the soil, as well as the duration and magnitude of the shaking.

Past Events

Colorado has a relatively short period of historical records for earthquakes. Figure 4.7 depicts the location of historical epicenters in the county and some of the state's larger earthquake epicenters. The map shows one recorded earthquake event in Elbert County.

The event for this epicenter took place on October 13th, 1966, and was recorded with a 3.0 magnitude.

Figure 4.7 Elbert County Historical Earthquakes



Location

There are no known faults in Elbert County according to the Colorado Geological Survey. El Paso and Douglas Counties are the only neighboring counties with faults.

Frequency

According to the U.S. Geological Survey, the probability that a magnitude 5.0 or greater earthquake will occur in the next 50 years in Elbert County is 10 percent or less. Small earthquakes that cause no or little damage are more likely.

Severity

Earthquakes can last from a few seconds to over 5 minutes; they may also occur as a series of tremors over several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage, or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides, or releases of hazardous materials compounding their disastrous effects.

Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. In contrast, large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area.

The impact of an earthquake is largely a function of the following components:

- Ground shaking (ground motion accelerations)
- Liquefaction (soil instability)
- Distance from the source (both horizontally and vertically)

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Damage and life loss can be particularly devastating in communities where buildings were not designed to withstand seismic forces (e.g., older or historic structures). Other damage-causing effects of earthquakes include surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground.

Earthquakes are typically classified in one of two ways: by the impact on people and structures, measured as intensity; or by the amount of energy released, measured as magnitude. Table 4.10 presents the Modified Mercalli Intensity Scale aligned with the Richter Scale Magnitude to show how these classifications approximately align.

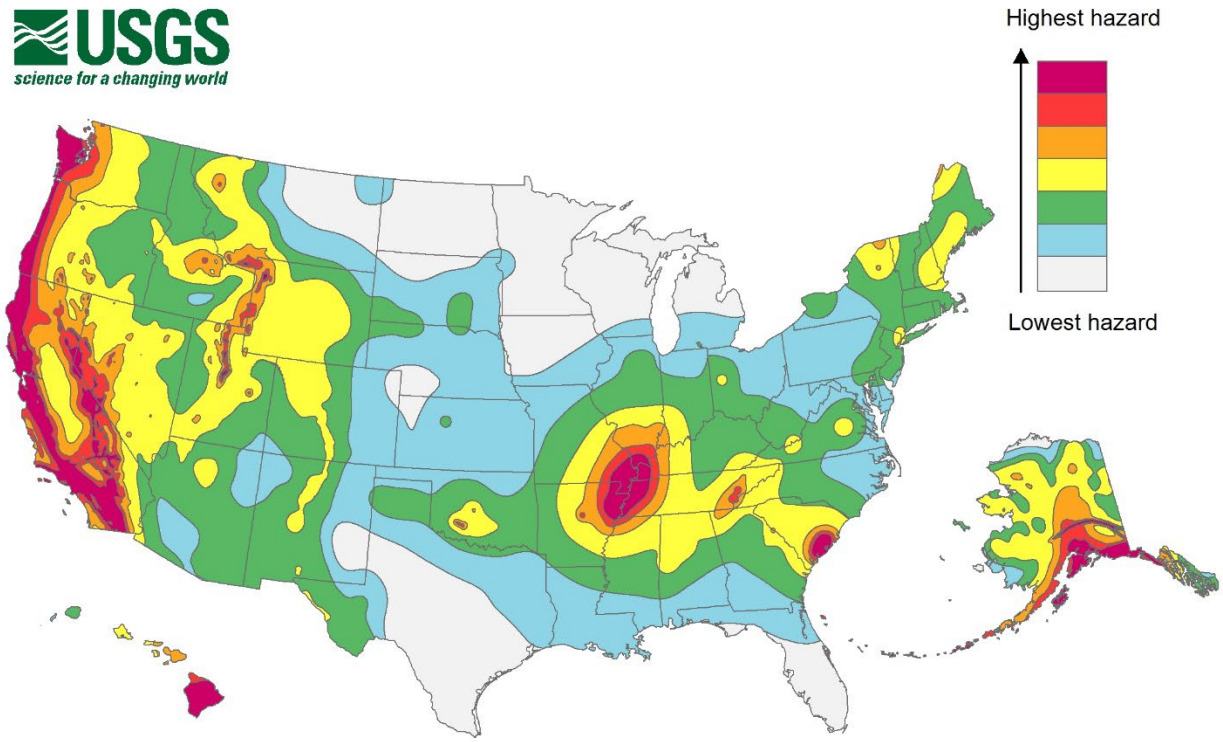
Table 4.10 Modified Mercalli Intensity Scale

Scale	Intensity	Description of Effects	PGA (g)	Richter Scale Magnitude
I	Instrumental	Detected mostly by instruments.	<0.0017	**<4.2**
II	Feeble	Some people feel it	0.0018-0.014	
III	Slight	Felt by people indoors, like a truck rumbling by		
IV	Moderate	Felt by people walking	0.015-0.039	**<4.8**
V	Slightly Strong	Sleepers are awakened, dishes and windows disturbed	0.040-0.092	**<5.4**
VI	Strong	Trees sway, suspended objects swing, objects fall off shelves	0.093-0.18	**<6.1**
VII	Very Strong	Mild alarm, walls crack, plaster falls	0.19-0.34	**<6.9**
VIII	Destructive	Moving cars are uncontrollable, poorly constructed buildings greatly damaged	0.35-0.65	
IX	Ruinous	Some houses collapse, ground cracks, pipes are break open.	0.66-1.24	**<7.3**
X	Disastrous	Significant ground cracks and many buildings destroyed. Liquefactions and landslides occur.	>1.24	**<8.0**
XI	Very Disastrous	Buildings and bridges collapse, roads, railways, pipes, and cables destroyed, other hazards triggered	>1.24	**<8.1**
XII	Catastrophic	Total destruction. Waves are seen on the ground surface.	>1.24	**>8.1**

The USGS created a map to illustrate overall hazard potential across the country. Figure 4.8 shows the long-term national seismic hazard. The figure, per the USGS description:

> Earthquake hazard map showing peak ground accelerations having a 2 percent probability of being exceeded in 50 years, for a firm rock site. The map is based on the most recent USGS models for the conterminous U.S. (2018) .... The models are based on seismicity and fault-slip rates, and take into account the frequency of earthquakes of various magnitudes. Locally, the hazard may be greater than shown because site geology may amplify ground motions.

Figure 4.8 Long-term National Seismic Hazard Map (2018)



Warning Time

There is currently no reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short, but it could allow for someone to get under a desk, step away from a hazardous material they are working with, or shut down a computer system.

The main shock of an earthquake can usually be measured in seconds, and rarely lasts for more than a minute. Aftershocks can occur within the days, weeks, and even months following a major earthquake.

Secondary Hazards

Earthquakes have to potential to cause a variety of secondary hazards including avalanche, dam failure, landslide, and subsidence. An earthquake can also trigger a hazardous materials release, transportation impacts, ignite urban fires, and cause utility disruption, such as flooding from severed water pipelines.

Exposure and Vulnerability

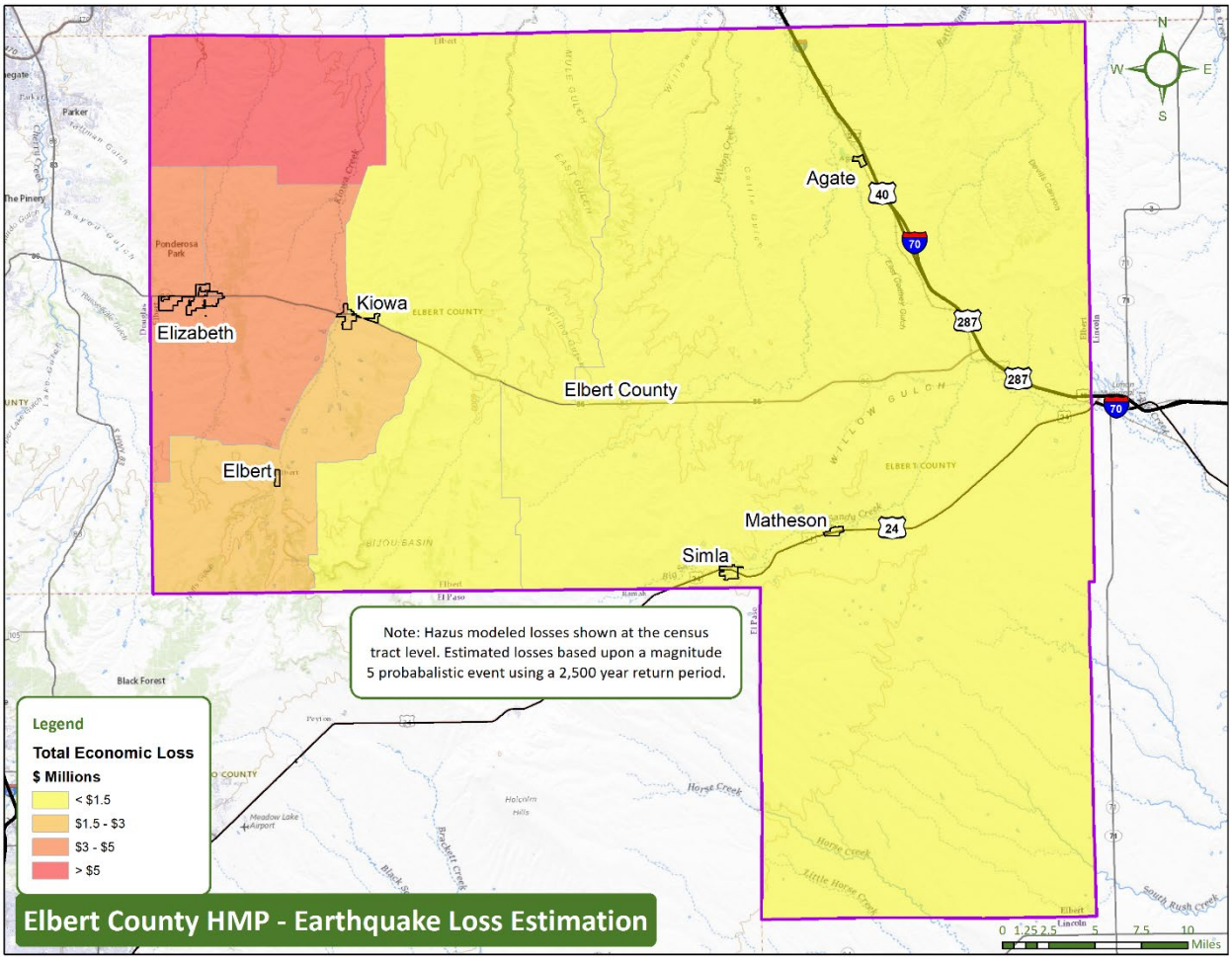
Hazus

When assessing the risk for seismic hazards the FEMA Hazus Loss estimation software which models the effects of various event scenarios, is the most appropriate tool. Using Hazus as a scenario modeling tool provides an acceptable means of forecasting earthquake damage, loss of infrastructure functionality, casualties, and numerous other factors.

Hazus 5.1 was used to conduct an earthquake analysis which was modeled using a 5.0 magnitude probabilistic event. The model utilized a 2,500 year return period. This return period equates to a 2% probability of occurrence in 50 years and is the return period used by the International Building Code as the basis for seismic building design. This scenario was used because it represents a “worst case scenario” and included an analysis of approximately 9,000 buildings valued at over $2.6 billion.

The Hazus software include a number of variables in order to arrive at the estimated values of loss and these loss estimates should not be taken as precise measures. This information should be viewed from the perspective of potential magnitude of expected losses. Hazus modeled expected losses in each census tract in the county and Figure 4.9 shows these loss estimates.

Figure 4.9 Elbert County Earthquake Loss Estimation



The Hazus loss estimates related to the structures and Lifelines affected, expected debris, and residential impacts are below.

- Building-related economic losses are estimated to be approximately $21.4 million
- An estimated 249 buildings will be at least moderately damaged
- Over 72% of total losses are residential buildings
- No major damages are expected to any transportation or utility facilities; however, water pipeline breaks and leaks are anticipated
- 5,000 tons of debris are expected to be generated (200 truckloads @25 tons/truck)

More detailed information can be found in the Earthquake Hazus Risk Report.

Lifelines

All Lifelines can be impacted significantly by an earthquake. Even with minimal damage Food, Water & Shelter can be greatly affected due to need for sheltering displaced individuals, the likelihood of water pipelines leaking and breaking, and the possible contamination of the drinking water supply.

Infrastructure damage to Communications, Energy, and Transportation can range from minimal impacts on functionality to systems completely unable to provide information and power to the community.

Transportation can be slowed by small upheavals in pavements or completely halted due to downed bridges or impassable roadways.

Health & Medical operations can be disrupted due to building damage or inability to transport patients. Fatality management may be needed on a large scale. Safety and Security may be unable to meet community needs if there is building or equipment damage. Hazardous Materials have the potential to be released from facilities or impacted in transit.

People

All people in the county are at risk to earthquakes. Depending on the location, magnitude, and other characteristics of the event, the effect on life safety can vary drastically. In a populated, developed area the risk of people being harmed is much higher than an event that affects a rural area.

Environment

Earthquakes can change the very landscape of an environment, as ground openings, liquefaction, and landslides are possible. Wildlife may leave the area for an extended period, especially if an ecosystem is impacted. The secondary impacts of a dam failure or fire being ignited could have devastating effects in addition to the damage from the earthquake

Property

There are many factors that affect the property damage an earthquake is capable of inflicting. Age and type of a building, as well as the materials used in construction all contribute to the likelihood of withstanding an earthquake with minimal damage. Historic buildings are especially at risk for these reasons.

Buildings constructed to meet updated codes or retrofitted to bring them up to code are at an advantage if an event were to happen. These codes are rated to a certain level of seismic activity; however, if an event of higher magnitude happens, serious damage is still possible.

Damages from an earthquake can be on a spectrum, cosmetic and easily repaired or making a building uninhabitable. The variables of an event, as well as characteristics and the specifics of each building make estimation of damages difficult.

Economy

Earthquakes have the potential to impact the economy on a large scale. Depending on the magnitude and location of the earthquake there could be extensive damage to infrastructure, buildings, and roads. Major damage to any of these would disrupt daily operations and require considerable construction and repairs. The duration of recovery could have a significant effect on the ability of businesses to reopen.

Future Trends in Development

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is crucial to public safety as growth continues and development increases. Adherence to these existing building codes and including adoption of more recent codes by Simla will ensure construction is more likely to withstand a seismic event.

Probability of Future Occurrences

By studying the geologic characteristics of faults, geoscientists can often estimate when the fault last moved and estimate the magnitude of the earthquake that produced the last movement. Because the occurrence of earthquakes is relatively infrequent in Colorado and the historical earthquake record is short, it is difficult to estimate magnitude, timing, or location of any future events.

Based on best available data from USGS, the earthquake hazard is classified as very low for Elbert County. This means that there is less than a 2% chance of potentially damaging earthquake occurring in the planning area in the next 50 years.

While there are no mapped faults in the county, seismic events in neighboring counties could have significant impacts over great distances.

Climate Change Impacts

The impacts of global climate change on earthquake probability are unknown.

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.

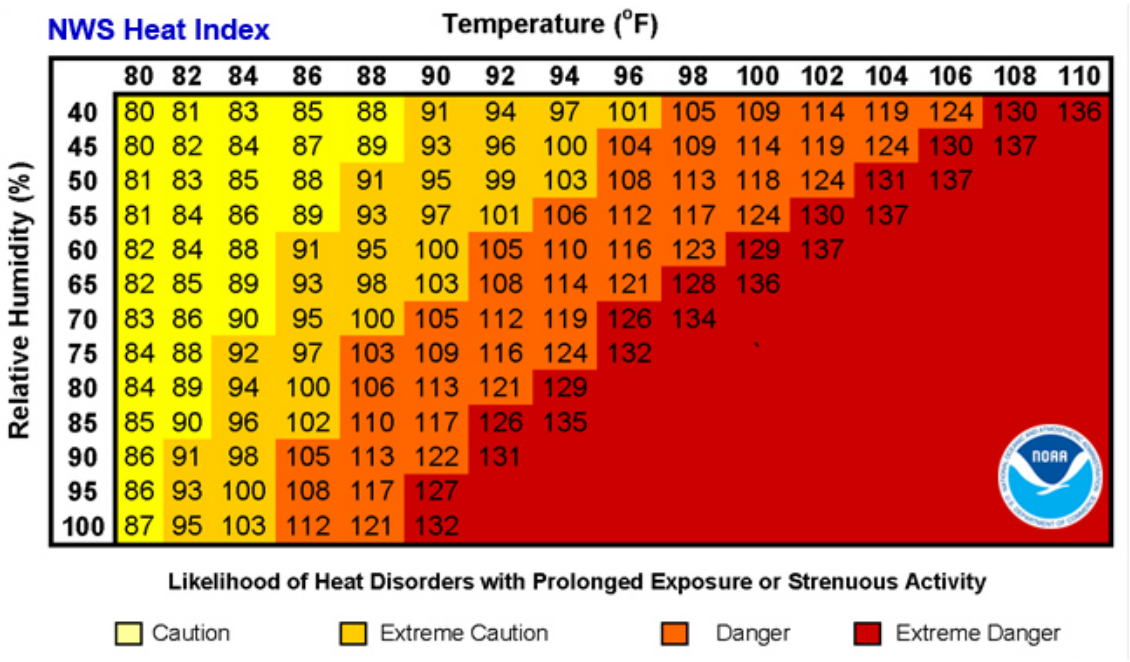
4.7 Extreme Heat

General Background

Excessive heat events are characterized by the U.S. Environmental Protection Agency (EPA) as "summertime weather that is substantially hotter or more humid than average for a location at that time of year" (EPA, 2006). Criteria that define an excessive heat event may differ among jurisdictions and within the same jurisdiction depending on the time of year. Excessive heat events are often a result of more than just ambient air temperature. Heat index tables (Figure 4.10) are commonly used to provide information about how hot it feels which is based on the interactions between several meteorological conditions. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds which can be produced by very hot, dry air, can be extremely hazardous.

According to the North America Land Data Assimilation System (NLDAS), extreme heat events are also characterized as periods with a duration of at least 2 or 3 consecutive days, in which an absolute threshold or threshold relative to the jurisdiction is surpassed.

Figure 4.10 NOAA National Weather Service Heat Index



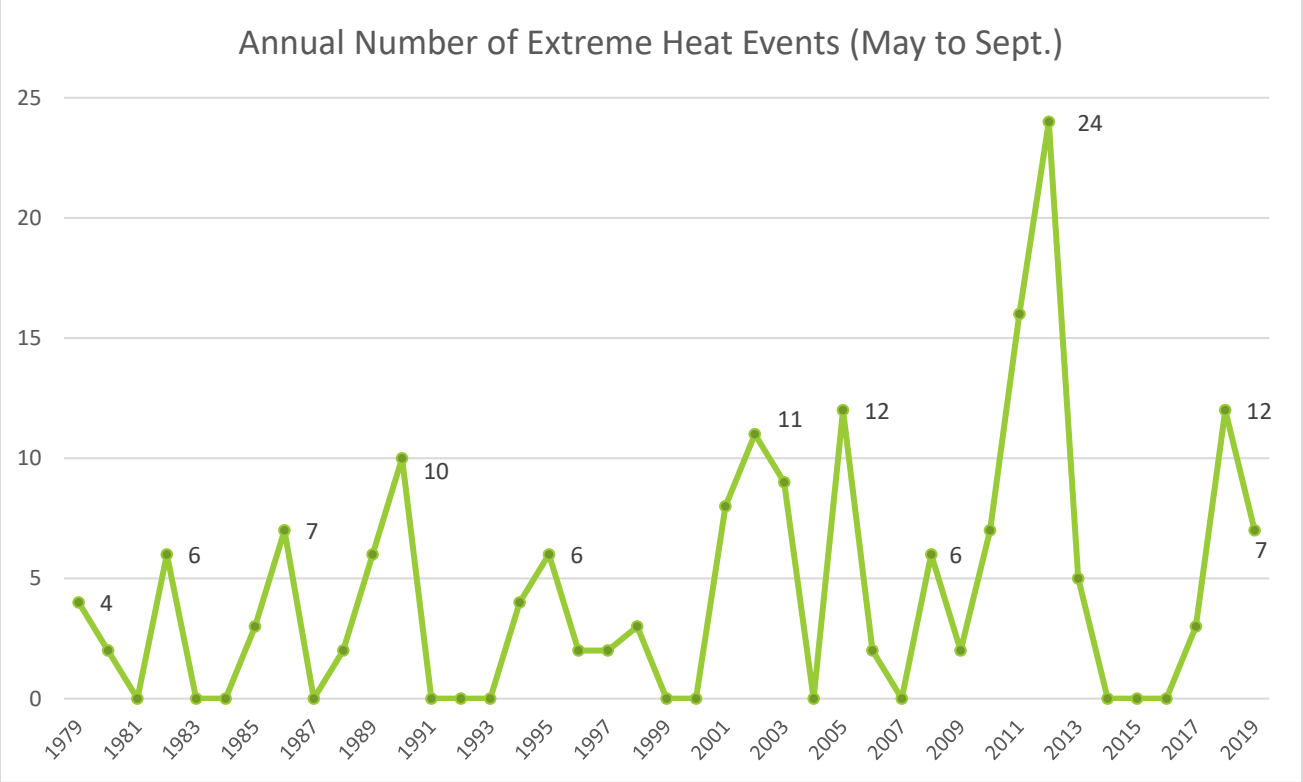
Past Events

Elbert County has seen multiple extreme heat events since 1979.

The NLDAS is a collaboration project among several groups: the NOAA National Centers for Environmental Prediction (NCEP) Environmental Modeling Center (EMC), the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC), Princeton University, the National Weather Service (NWS) Office of Hydrological Development (OHD), the University of Washington, and the NCEP Climate Prediction Center (CPC).

The NLDAS data in Figure 4.11 shows the annual number of extreme heat events, between 1979 and 2021. These events are a minimum duration of 2 consecutive days with temperatures over 90°, between the months of May and September, from 1979 to 2019. Most notable are the 16 events in 2011 and 24 events in 2012. The years 1990, 2002, 2005, and 2018 each had over 10 extreme heat events.

Figure 4.11 Annual Number of Extreme Heat Events between May and September



Location

The entire county is at risk to extreme heat events; however, these events may be exacerbated in more urban areas. This is due to the reduced air flow, reduced vegetation, and increased generation of waste heat which can contribute to temperatures that are several degrees higher than in surrounding rural or less urbanized areas. This phenomenon is known as urban heat island effect.

Frequency

There have been 181 extreme heat events in the 41-year period between 1979 and 2019. However, 14 of those years did not have an extreme heat event. Another 11 years had 5 or fewer extreme heat events. While the remaining 147 events took place over 16 years, 24 of these occurred in one year.

Severity

Severity depends upon multiple factors, not just meteorological. While departure from typical temperatures are the basics of an event occurring, exposure and inability to find respite can drastically increase risk and prove deadly. The characteristics of the building people are housed in and whether

there is air conditioning or other temperature control means also have considerable impacts. Populations susceptible to heat for health reasons or due to occupation, such as construction or agriculture, can be affected even if it is not considered an extreme heat event.

Temperatures abnormal to the area for extended periods contribute to sunstroke, heat cramps, and heat exhaustion. Pets and livestock are also vulnerable to heat-related injuries. Crops can be vulnerable as well.

Warning Time

NOAA issues outlooks for extreme heat 8-14 days, as well as 3-7 days in advance and provides hourly forecasts, advisories, watches, and warnings when dangerous heat becomes likely or imminent.

Secondary Hazards

Excessive heat events can cause failure of motorized systems such as ventilation systems used to control temperatures inside buildings. They can also further magnify drought conditions and effects, as well as increase wildfire risk.

Exposure and Vulnerability

Everything in the planning area would be exposed, to some degree, to the impacts of moderate to extreme heat conditions. The majority of older homes in Colorado do not have air conditioning, making an extreme heat event even more dangerous.

Lifelines

The Energy Lifeline can be impacted by extreme heat events as power outages may occur. Additionally, the Transportation Lifeline may experience disruption in services due to infrastructure damage. According to the State of Colorado Hazard Mitigation Plan, concrete pavements have experienced “blowouts or heaves” both on local highway and the higher volume parkway and interstate systems. Blowouts occur when pavements expand and cannot function properly within their allotted spaces. Pavement sections may rise up several inches during such events. These conditions can cause motor vehicle accidents in their initial stages and can shut down traffic lanes or roadways entirely until such times as the conditions are mitigated.

People

All people are at risk of the effects of extreme heat; however, certain populations are less able to cope with the effects. Those who are 65 years and older, children, and those with access and functional needs are especially at risk of adverse impacts. People living in social isolation may be unable to get the assistance they need if the heat begins to affect them such as losing consciousness. People who traditionally work outside such as agricultural workers, construction workers, utility workers, and others are at considerable risk due to extended time outside doing extensive manual work.

It is critical these populations be identified in Elbert County, to ensure proper steps are taken to keep people safe and healthy. This may include cooling stations and community outreach to bring people to cooler areas.

Environment

While extreme heat is a natural phenomenon, the frequency and severity are increasing. The environment has evolved to cope with previous heat events, but new patterns could prove detrimental to flora and fauna. Extended periods of extreme heat can have unknown consequences, as well as those seen before such as increased algal blooms potentially impacting water sources.

Property

The only impact extreme heat has on general building stock is increased demand on air conditioning equipment which in turn may cause strain on electrical systems.

Livestock and crops can be negatively impacted. Livestock are susceptible to the dangerous effects of extreme heat and deaths are possible if adequate shelter and cooling areas are unavailable. Crops may be unable to withstand an extended extreme heat event, and events have the potential to stunt growth and reduce yields.

Economy

Extreme heat events are not likely to have direct impacts on the overall economy. However, agricultural operations could be greatly affected, as crops and livestock may be unable to cope with extreme heat events.

According to a 2021 study by a team of researchers from around the world, the impacts on agriculture have been underestimated. Based on analysis of global datasets from 1979 to 2016, agricultural losses were larger than predicted, as much as 5-10 times.[4] This research is being used to develop climate change adaptation possibilities to reduce projected losses from extreme heat events.

Future Trends in Development

Vulnerability to extreme heat will increase as population growth increases, especially in municipal areas, although structures are not expected to see any increased risk from extreme heat events.

Probability of Future Occurrences

Based on historical data from the past 41 years, there is a 66% chance that the county will experience at least one extreme heat event annually. Impacts from climate change will most likely increase the likelihood of these events and therefore extreme heat events should be expected every year.

Climate Change Impacts

Temperatures are increasing due to climate change and this will likely result in more extreme heat days as the average temperature increases. Extreme heat events are becoming more frequent, more severe, and longer lasting. More frequent extreme heat events could end up being more cause for concern than the long-term change in temperature and precipitation averages.

[4] Heat waves could cause 10 times more crop damage than now projected, research finds, University of Colorado Boulder

4.8 Flood

General Background

A flood is a general and temporary condition of partial or complete inundation of normally dry land areas from:

- the overflow of stream banks,
- the unusual and rapid accumulation of runoff of surface waters from any source, or
- mudflows or the sudden collapse of shoreline land.

Flooding results when the flow of water is greater than the normal carrying capacity of the stream channel. Rate of rise, magnitude (or peak discharge), duration, and frequency of floods are a function of specific physiographic characteristics. Generally, the rise in water surface elevation is quite rapid on small (and steep gradient) streams and slow in large (and flat sloped) streams.

The causes of floods relate directly to the accumulation of water from precipitation, rapid snowmelt, or the failure of manmade structures such as dams or levees. Floods caused by precipitation are further classified as coming from: rain in a general storm system, rain in a localized intense thunderstorm, melting snow, rain on melting snow, and ice jams. Floods may also be caused by structural or hydrologic failures of dams or levees. A hydrologic failure occurs when the volume of water behind the dam or levee exceeds the structure‘s capacity resulting in overtopping. Structural failure arises when the physical stability of the dam or levee is compromised due to age, poor construction and maintenance, seismic activity, rodent tunneling, or myriad other causes. For more information on floods resulting from dam and levee failure refer to the Dam / Levee Incident section of this Plan.

Flooding in the county is now predominantly the result of snowmelt and cloudbursts which result in flash flooding. Severe flash flooding poses the greatest risk. These rain events are most often microbursts which produce a large amount of rainfall in a short amount of time. Flash floods, by their nature, occur suddenly but usually dissipate within hours. Despite their sudden nature, the National Weather Service is usually able to issue advisories, watches, and warnings in advance of a flood.

The potential for flooding can change and increase through various land use changes and changes to land surface. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining watersheds or natural drainage channels. These changes are commonly created by human activities (e.g., development). These changes can also be created by other events such as wildfires. Wildfires create hydrophobic soils, a hardening or “glazing” of the earth’s surface that prevents rainfall from being absorbed into the ground, thereby increasing runoff, erosion, and downstream sedimentation of channels.

Potential flood impacts include loss of life, injuries, and property damage. Floods can also affect infrastructure (water, gas, sewer, and power utilities), transportation, jobs, tourism, the environment, and ultimately local and regional economies.

Past Events

The county has seen significant flood events over decades, most notable are those in 1935, 1965, 1997, and 1999. The event in 1935 caused devastating damages. Flooding on Kiowa Creek destroyed three-fourths of the structures located in the Town of Elbert and resulted in nine deaths. The town was not rebuilt. Since this event small agricultural and flood control dams have been constructed throughout the county, altering flood patterns.

Table 4.11 shows the historical details of floods recorded in the county. Numerous data sources were used; however, damages and specific details for some of these events were not available.

Table 4.11 Elbert County Reported Damaging Floods (1878-2019)

Date	Location	Description	Damages
May 21, 1878	Kiowa Creek	A Union Pacific locomotive plunged into the sands of Kiowa Creek during this flood and was never found.	
May 31, 1935	Kiowa Creek	Seven lives lost at Elbert and nine lives lost total. All bridges lost, 59 buildings destroyed, water 8-15 feet deep, and 5 feet of sand. Three-fourths of town of Elbert destroyed and not rebuilt. A peak discharge was measured at 43,500 cubic feet per second (cfs) on Kiowa Creek at Elbert.	
June 15-17, 1965	Bijou, Running, Kiowa, and Plum creeks	In the 118 square mile Kiowa Creek basin, above the town of Kiowa, the floods were several times the size of the design floods for the project structures, with a peak discharge of 41,500 cubic feet per second (cfs) on Kiowa Creek at Elbert, resulting in extensive erosion damage. Many acres of crop and pasture land were a total loss from heavy erosion, streambank cutting, or sediment deposition. The three forks of Bijou Creek washed out or damaged bridges on the main line of the Union Pacific Railroad and Interstate-70.	
May 23, 1973		Heavy rains, snowmelt, and flooding. FEMA-385-DR	
July 29-30, 1997	Kiowa, Simla	Flooding and flash flooding caused water two feet of water to cover portions of roadway near Kiowa. High waters forced the evacuation of several residents in Simla. Highway 86, between Simla and Limon was closed due to high waters. The flood also closed portion of Interstate 70 west of Limon. FEMA-1186-DR	**$400,000 property damages**
August 21, 1998	Coal Creek	Heavy rain caused flash flooding along Coal Creek in northwest Elbert County. Large tree trunks and some boats were reportedly washed downstream. County Road 50 along the Arapahoe/Elbert County line was closed as floodwaters, up to a foot deep, covered the roadway. County Road 186 was also washed out.	

Date	Location	Description	Damages
April 29 – May 19, 1999		The combination of a persistent upslope and increased runoff allowed for several creeks, rivers, and streams to jump their banks. Damage to gravel roads and culverts. FEMA-1276-DR	**$180,000 property damages**
August 5, 1999		Primarily road damage.	**$772,000 property damages**
July 17, 2000	Whiskey Gulch, north of Elizabeth, tributary of Running Creek	Torrential rainfall, up to 3.5 inches in an hour, caused flash flooding along Whiskey Gulch near Elizabeth. Several roads were washed out, culverts and agricultural lands were damaged, and basements flooded during the storm. Along County Road 13, about 6 miles north-northwest of Elizabeth, rushing water washed away a 15-ft section of the road. The floodwaters forced debris and mud into four huge culverts, sending water onto the road.	
September 8, 2002	East-central Elbert County	Flood water washed out two county roads in east central Elbert County. Another roadway, County Road 98 was inundated with two feet of water.	
May 15, 2003	East-central Elbert County; Sandy Creek	Flash flooding was reported eight miles south west of Interstate 70, along State Highway 86. Highway 86 was closed due to flooding along the Elbert and Lincoln County lines as Sandy Creek jumped out of its banks.	
June 19, 2005	East-central Elbert County	Thunderstorms producing heavy rain and hail caused flash flooding. The heavy rain washed out multiple county roads and several needed to be rebuilt.	
July 2, 2006	Kiowa	Near Kiowa, 2.5 inches of rain fell in less than 2 hours. Several roads and culverts in the area were either damaged or washed out.	
July 17, 2006	Cedar Point	Severe thunderstorms caused flash flooding near exit 354 off Interstate 70. A spotter reported a nearby road inundated under four feet of water.	

Date	Location	Description	Damages
September 1, 2006	Eastern Elbert County	Thunderstorms brought heavy rain and flashing flooding to portions of Elbert County. Nine miles southeast of Agate, flood waters inundated State Highway 24 with two feet of water. County roads 134 (three miles west of Cedar Point) and 153 (one mile south of Agate), were inundated with up to two feet of water.	
June 11, 2010	River Bend	Heavy rain caused flash flooding along Interstate 70 at the River Bend Exit. Several cars were reportedly stuck in the floodwaters.	**$30,000 property damages**
July 4, 2010	Elizabeth	Flooded the entire storm sewer system. In 2011 the plan went into effect to budget and BOT approved for $381,385.75 for the 8 out of the 12 locations identified to mitigate the drainage issues.	**$25,000 property, $25,000 crop damages**
August 2, 2010	Kutch	Thunderstorms producing very heavy rain caused flash flooding near Kutch. Several county roads were washed out by the floodwaters.	**$10,000 property damages**
July 12, 2011	Lowland	A thunderstorm produced very heavy rain, 5 inches in less than 3 hours. Flash flooding made unpaved roads impassable as about 6 inches of water a city block wide, inundated County Road 166, west of Ridge Road. In the Chaparral Subdivision, southwest of Agate, roadways were impassable as well. Extensive field flooding was also reported.	**$5,000 property, $10,000 crop damages**
July 12, 2014	Elizabeth	Over three inches of heavy rain caused flash flooding north and northwest of Elizabeth. The rainfall flooded barns and fields, and inundated the surrounding roadways with standing water.	**$10,000 property, $15,000 crop damages**
May 4, 2015	Matheson	Heavy rainfall washed out several county roads.	**$15,000 property, $5,000 crop damages**
May 8, 2015	Kiowa	Flooding and flash flooding washed out several county roads including: CR73 from CR112 to CR98; Freese Road from Colorado 86 to CR112; CR102, from Double Tree Ranch to the top of the Bluff; CR9 between Colorado 86 and CR98; CR106, from Canyon Road to CR13; Maul Road also suffered extensive damage.	**$25,000 property, $10,000 crop damages**

Date	Location	Description	Damages
June 11, 2015	Elizabeth	Thunderstorms producing heavy rainfall caused flooding and flash flooding across parts of the town and adjacent plains. Heavy rain flooded several rural roads. Basements were flooded and flooding was reported along Coal and Running Creeks. Elbert County Road 106 was closed due to high water between Elbert County Roads 5 and 13. Flash flooding washed out a 6-ft diameter culvert at the end of Glennon Rd., south of Elbert County Road 186. A trained spotter measured 2.22 inches of rainfall in 30 minutes which produced flash flooding.	**$30,000 property, $5,000 crop damages**
June 15, 2015	Kiowa	A thunderstorm with very heavy rain, up to 4 inches, produced flash flooding. Elbert County Road 178, between ERC 53 and Wolf Creek Drive was impassable to high water.	**$15,000 property, $10,000 crop damages**
August 1, 2019	Matheson	Flash flooding occurred over southeast Elbert County. Several county roads were either flooded or washed out during the event.	**$15,000 property, $15,000 crop damages**

Source: Colorado Water Conservation Board (CWCB), National Centers for Environmental Information (NCEI), Public Entity Risk Institute (PERI), National Center for Atmospheric Research (NCAR).

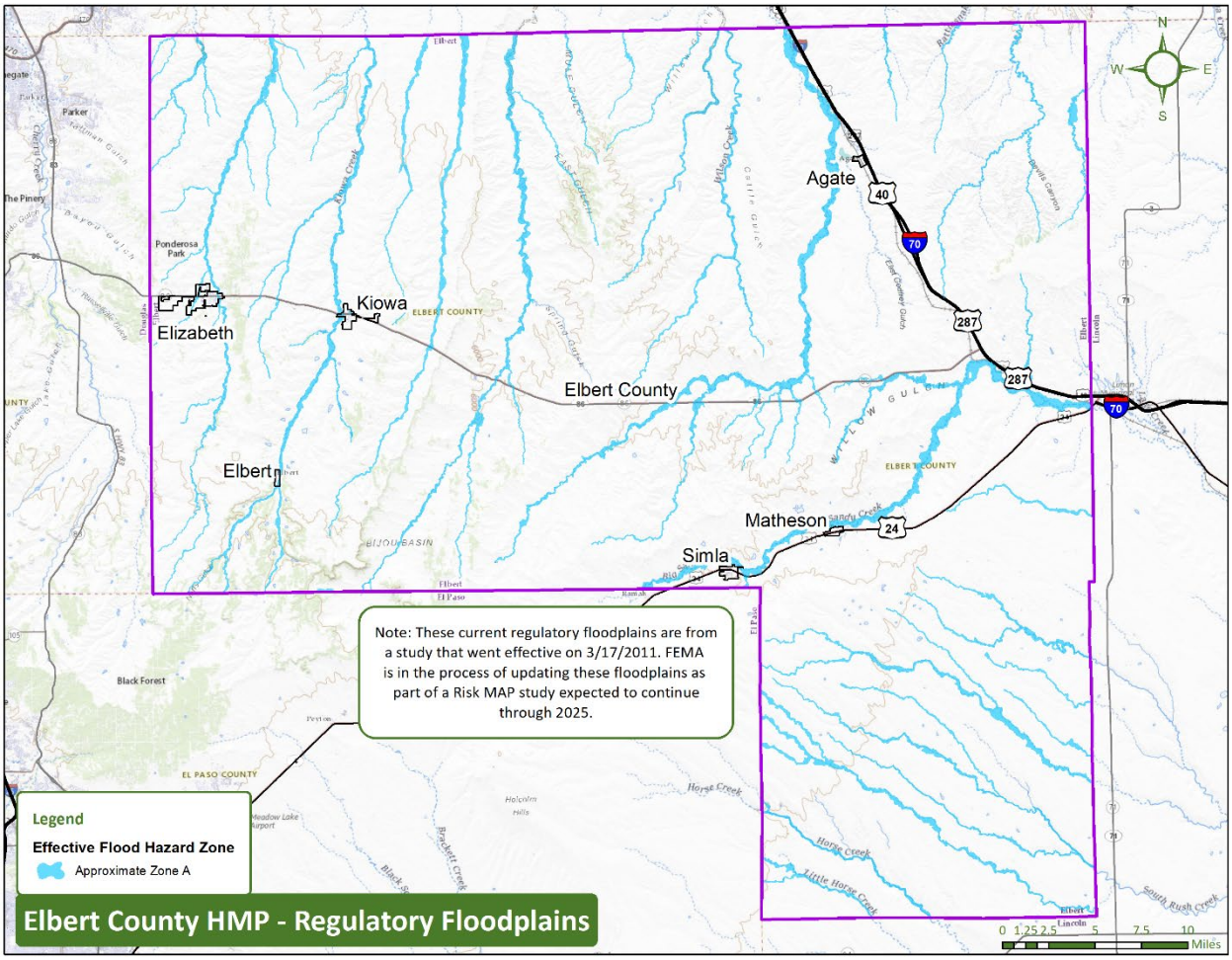
Location

Elbert County is located within the South Platte River drainage basin in east central Colorado and streams also flow into the Arkansas River. Running Creek in Elizabeth and Kiowa Creek in Kiowa are the greatest sources of flood hazards. Other north-oriented creeks include Bijou, West Bijou, Middle Bijou, and East Bijou creeks. Big Sandy Creek and Horse Creek trend more easterly and flow into the Arkansas River.

Elbert County is subject to flash flooding and slow rise flooding related to severe weather events between May and June, when snowmelt runoff is flowing.

Figure 4.12 shows the mapped regulatory floodplain in the county based on FEMA's published Flood Insurance Rate Map from 2011, for the County and its municipalities.

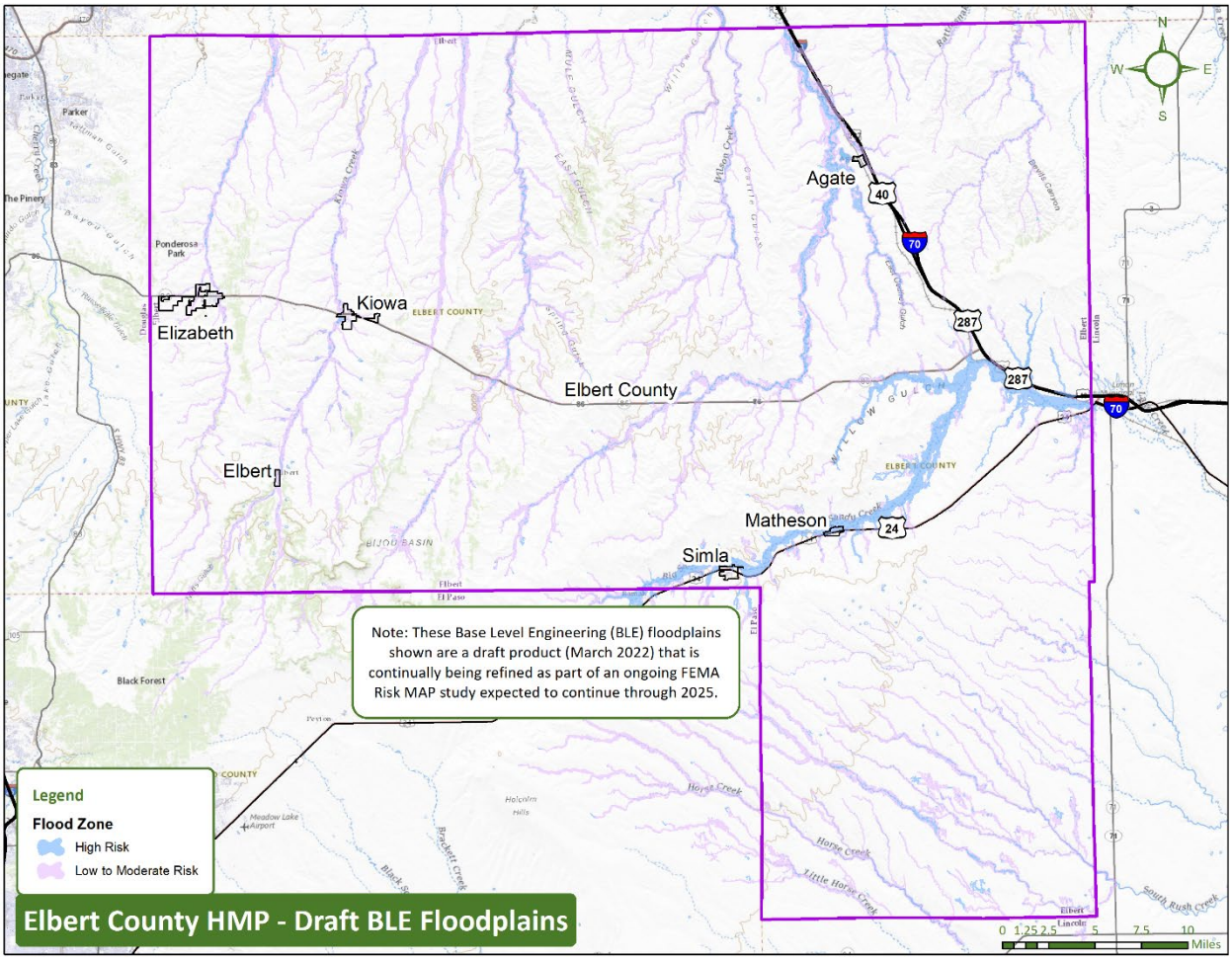
Figure 4.12 Elbert County Regulatory Floodplains



As part of Elbert County's on-going participation in FEMA's Risk MAP project, updated floodplains are being developed utilizing base level engineering (BLE). BLE is an engineering analysis technique used to determine the hydrologic and hydraulic conditions in the vicinity of streams and water courses during the 1% annual chance flood. BLE uses high and low to moderate flood risk designations. High risk is equivalent to the 1% annual chance flood while low to moderate flood risk designates properties prone to flooding during a 0.2% annual chance flood.

Figure 4.13 illustrates the draft BLE floodplain across the county. These floodplains are still in draft version and continued mapping efforts are underway to better map the floodplains in certain locations across Elbert County.

Figure 4.13 Elbert County Draft BLE Floodplains



Frequency

The frequency and severity of flooding are measured using a discharge probability which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to estimate the probability of occurrence for the different discharge levels. The 100-year discharge has a 1% chance of being equaled or exceeded in any given year. These measurements reflect statistical averages only; it is possible for two or more floods with a 100-year or higher recurrence interval to occur in a short period. The same flood can have different recurrence intervals at different points on a river.

The extent of flooding associated with a 1% annual probability of occurrence (the “base flood” or “100-year flood”) is used as the regulatory boundary by FEMA and many other agencies. Also referred to as the special flood hazard area (SFHA), this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities.

Severity

The depth and velocity of floodwaters coupled with the length of time areas remain inundated with water, determine the severity of the event. Many SFHA’s also provide water-surface elevations which

describe the elevation of water that will result from a given discharge level. This is one of the most important factors used in estimating flood damage.

Warning Time

Due to the sequential pattern of meteorological conditions needed to cause serious flooding, it is unusual for a flood to occur without warning. Warning times for floods can be between 24 and 48 hours. Flash flooding can be less predictable, but potential hazard areas can oftentimes be warned in advance of potential flash flooding danger.

Secondary Hazards

There are numerous secondary hazards for flooding including debris flows and bank erosion which in some cases can be more harmful than actual flooding. Flooding is also responsible for hazards such as landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are a secondary hazard of flooding, if storage tanks rupture and spill into streams, rivers, or storm sewers.

Exposure and Vulnerability

Lifelines

Food, Water & Shelter and Health & Medical Lifelines are the most critical affected by flooding. Floodwaters can back up drainage systems and block culverts with debris from flood events, causing localized flooding. Floodwaters can get into drinking water supplies, causing contamination. Sewer systems can be backed up, causing wastewater to spill into homes, neighborhoods, rivers, and streams. Underground utilities, including Energy and Communications Lifeline infrastructure, can also be damaged, or rendered unusable by the waters.

Identifying populations, including access and functional needs (AFN), who may be at risk if infrastructure is damaged by flooding is critical. Impacts to the Transportation Lifeline, such as roads, bridges, or railroads that are blocked or damaged can isolate residents and can prevent access throughout the county. This is especially crucial for those needing emergency service providers or for getting crews in to make repairs.

There are no Lifelines or Tier II hazardous materials facilities with exposure to the 1% annual chance flood or BLE determined floodplains in Elbert County.

People

People living in floodplains, known flooding areas, or near areas where flash floods can occur are at an increased risk from the hazard. Those in the community with access and functional needs (AFN) may have issues evacuating and are at increased further risk, including the elderly, children, those with mobility or communication issues, those with low incomes, institutionalized, and people who may be unfamiliar with the area. Floods can cause serious injury and death if people are unable to get to safe locations. Some of the population may be displaced from their homes, with varying durations which can strain community resources.

Non-English speaking populations are also included as communications and emergency messaging may not be available in languages other than English. In general, anyone who does not have adequate access to warnings from an emergency warning system may be disproportionately impacted by the hazard.

The dangers of flash flooding pose an even greater risk, as those in these populations may not be able to extricate themselves from an immediately threatening situation. The need for emergency responders to place these populations as a priority is crucial to the best possible outcomes.

Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. However, with human development factored in, flooding can impact the environment in negative ways. Wildlife habitats can be impacted, due to altered food availability and interrupted breeding patterns. The effects on water quality due to silt and debris can impact wildlife downstream of the flooding. Erosion of riverbanks can permanently alter a waterway and vegetation on the banks may not recover from the damage. Aquatic life can wash onto roads or over dikes into flooded fields. Pollution from roads such as oil and hazardous materials can wash into rivers and streams. During floods, these can settle onto normally dry soils, polluting them for agricultural uses.

Property

Many properties in the county are vulnerable to flooding, including those that may not be within a mapped floodplain. While some properties make be flood proofed, the majority are likely to be significantly damaged if in the flooded area. Properties near waterways may have stability issues as the flood waters erode the banks and carry debris, while properties in low-lying areas are more vulnerable as these are where water would collect

Table 4.12 breaks down the type and locations of buildings exposed to the 1% annual chance floodplains developed in 2011. Notably, the majority of the 101 structures exposed are located on agricultural parcels, with 70 structures found across all of the municipalities in the county. The remaining 31 properties are located in Agate, Elbert, Elizabeth, and Kiowa.

Table 4.12 Building Footprint Exposure to the 1% Annual Chance Floodplain

	Residential	Commercial	Agricultural	Exempt
Agate	5		23	2
Elbert			4	1
Elizabeth	5	4	15	1
Kiowa	3	5	6	5
Matheson			13	
Simla			9	
TOTAL	**13**	**9**	**70**	**9**

Table 4.13 and Table 4.14 show the building exposure data from the recent BLE mapping. BLE uses high and low to moderate flood risk designations. High risk is equivalent to the 1% annual chance flood while low to moderate flood risk designates properties prone to flooding during a 0.2% annual chance flood.

Agate, Elbert, and Simla have solely agricultural structures exposed to high risk flood areas. Agate has the highest number of agricultural structures exposed with a total of 25. Matheson has the highest number of residential buildings exposed to high risk flood areas, approximately 76% of the total residential structures exposed in the county.

Table 4.13 Building Footprints Exposed to Areas with a High Risk of Flooding (1% Annual Chance Flood)

	Residential	Commercial	Agricultural	Exempt
Agate			25	
Elbert			4	
Elizabeth	4	2	7	
Kiowa	1		9	1
Matheson	16	4	14	5
Simla			14	
TOTAL	**21**	**6**	**73**	**6**

Buildings exposed to areas with low to moderate risk of flooding are detailed in the following table. The majorities of these buildings agricultural and a third are located in Elizabeth. Matheson and Simla structure exposure included only agricultural structures, of which both municipalities have 10 buildings. Elbert, Agate, and Kiowa also have agricultural buildings, with 11, 8, and 6 respectively. Elizabeth has the most residential structures exposed to low to moderate flood risk areas.

Table 4.14 Building Footprints Exposed to Areas with a Low / Moderate Risk of Flooding (0.2% Annual Chance Flood)

	Residential	Commercial	Agricultural	Exempt
Agate	2		8	3
Elbert	4		11	2
Elizabeth	8	4	20	3
Kiowa			6	1
Matheson			10	
Simla			10	

	Residential	Commercial	Agricultural	Exempt
TOTAL	**14**	**4**	**65**	**9**

Data from the Elbert County assessor was utilized to show the type and value of parcels exposed to floodplains, the 1% annual chance and the high, low to moderate risk areas. Parcel level data may contain multiple structures, but it is possible only one structure is exposed to the floodplain areas. Hazard layers are not exact and therefore it can be difficult to determine exposure and value at a building footprint level. Parcel level data allows an overview of the value of parcels with exposure to the hazard layer.

The total actual values of parcels exposed to the 1% annual chance floodplain are shown in Table 4.15. Residential and agricultural parcels have total values of approximately $7 million each. Exempt parcels are valued at roughly $5.5 million and commercial parcels are valued at over $1.7 million. Elizabeth and Kiowa both have over $3 million each in residential parcels exposed to the floodplain.

Table 4.15 Value of Parcels Exposed to the 1% Annual Chance Floodplain

	Residential	Commercial	Agricultural	Exempt
Agate	$379,000			$2,400,000
Elbert		$951,000		$50,000
Elizabeth	$3,100,000	$765,000	$2,700,000	$341,000
Kiowa	$3,800,000		$2,100,000	$2,700,000
Matheson		$47,800	$1,400,000	
Simla			$791,000	
TOTAL	**$7,279,000**	**$1,763,800**	**$6,991,000**	**$5,491,000**

Table 4.16 details the value of parcels exposed to areas with a high flood risk and breaks the data down by location and type of parcel. The vast majority of exposed parcels are agricultural and make up over half of the total values of parcels exposed to the high risk flood areas. Elizabeth, Kiowa, and Matheson are the only municipalities with residential parcels exposed, with the highest total value of these parcels is in Kiowa at $3.1 million.

Table 4.16 Value of Parcels Exposed to Areas with a High Flood Risk (1% Annual Chance Flood)

	Residential	Commercial	Agricultural	Exempt
Agate			$3,270,000	

	Residential	Commercial	Agricultural	Exempt
Elbert			$1,940,000	
Elizabeth	$2,600,000	$48,000	$2,800,000	
Kiowa	$3,100,000		$2,480,000	$2,700,000
Matheson	$1,200,000	$48,000	$1,900,000	$300,000
Simla			$1,350,000	
TOTAL	**$6,900,000**	**$96,000**	**$13,740,000**	**$3,000,000**

The value of parcels exposed to low to moderate flood risk areas can be seen in Table 4.17. The highest value of parcels with this exposure is the agricultural parcels at a value of over $8.7 million. Elizabeth has the highest value residential parcels exposed, with a total of approximately $4,000,000. Agate has a considerable amount of exempt parcels, valued at almost $2.4 million. Kiowa, Matheson, and Simla have only agricultural parcels exposed to the low to moderate flood risk areas.

Table 4.17 Value of Parcels Exposed to Areas with a Low to Moderate Risk of Flooding (0.2% Annual Chance Flood)

	Residential	Commercial	Agricultural	Exempt
Agate	$379,000		$1,500,000	$2,370,000
Elbert	$950,000	$951,000	$1,500,000	$663,000
Elizabeth	$4,000,000	$717,000	$3,800,000	$520,000
Kiowa			$891,000	
Matheson			$875,000	
Simla			$170,000	
TOTAL	**$5,329,000**	**$1,668,000**	**$8,736,000**	**$3,553,000**

Economy

Flooding can have a long-term economic impact on individuals and the county. Homes that are damaged may require extensive repairs which can take place over a long duration, especially if mold develops. The cost of infrastructure repair for utilities, roads, and bridges, as well as the components of Lifelines may extend over multiple years as projects are prioritized and funds are acquired. Costs for debris clean-up can be considerable and can be a burden to property owners.

Returning to normal operations and daily life can take time which affects the day-to-day economy of the flooded area. Some businesses may struggle with repair costs and whether they can reopen at all.

National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRM) which are the principal tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program.

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure the following criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.

Elbert County and all its incorporated communities participate in the NFIP program. All will continue to comply with all NFIP requirements, including enforcing all locally adopted floodplain management regulations concerning existing structure improvements and new construction. The effective date for the current countywide FIRM is March 17, 2011. The county and participating communities are currently in good standing with the provisions of the NFIP and will continue compliance which is monitored by FEMA regional staff. Maintaining compliance under the NFIP is an important component of flood risk reduction. Table 4.18 provides an overview of the communities participating in the program.

Table 4.18 National Flood Insurance Program Participation

Jurisdiction	Date of Entry	Initial FIRM ID	Initial FHBM ID	Policies in Force	Claims since 1978	Total Coverage	Claims Paid since 1978
Elbert County	8/13/2007	3/17/2011	-	19	2	$5,244,900	$0
Elizabeth	5/22/2015	3/17/2011	9/06/1974	0	0	$0	$0
Kiowa	3/17/2011	3/17/2011	9/06/1974	1	0	$121,000	$0
Simla	10/22/2009	3/17/2011	9/13/1974	0	0	$0	$0

There are no recorded repetitive loss or severe repetitive loss properties in any of the participating jurisdictions.

Future Trends in Development

Future population change across the county is expected to be 2.7% over the next decade. It is important for municipalities to fully understand the risk presented by flood to those vulnerable areas to ensure new construction does not increase the county's collective risk.

All municipal planning partners are participants in the NFIP and have adopted flood damage prevention ordinances in response to its requirements.

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is crucial to public safety as growth continues and development increases. Adherence to these existing building codes and including adoption of more recent codes by Simla will ensure construction is more likely to withstand a flood event.

Probability of Future Occurrences

There have been 25 reported damaging floods since 1878, suggesting a relatively low probability, approximately 17%, for future damaging flooding in a given year. Damages can be under reported for various reasons, including insurance payouts not being recorded or no claims made in the first place, making it difficult to determine the extent to which the county has seen flood damages. Therefore, this probability for damaging floods has the potential to be higher.

Climate Change Impacts

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management, and ecosystem functions.
- Extreme climatic events have become more frequent, necessitating improvement in flood protection, drought preparedness, and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. High frequency flood events (e.g., 10-year floods) in particular, will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, floodways, bypass channels, and levees, as well as the design of local sewers and storm drains

4.9 Hazardous Materials Release

General Background

A hazardous material (also known as Hazmat) is defined by the U.S. Department of Transportation as "articles or substances which are capable of posing a risk to health, safety, property, or the environment, are listed or classified in the regulations and are transported in commerce."

Hazardous materials are defined and regulated in the United States primarily by laws and regulations administered by the U.S. Environmental Protection Agency (EPA), the U.S. Occupational Safety and Health Administration (OSHA), the U.S. Department of Transportation (DOT), and the U.S. Nuclear Regulatory Commission (NRC). Each has its own definition of a "hazardous material."

For the purpose of tracking and managing hazardous materials, the DOT divides regulated hazardous materials into nine classes. These classes are:

Class 1: Explosives

Class 2: Compressed Gases

Class 3: Flammable Liquids

Class 4: Flammable Solids

Class 5: Oxidizers and Organic Peroxides

Class 6: Toxic Metals

Class 7: Radioactive Material

Class 8: Corrosive Material

Class 9: Miscellaneous

Past Events

According to the Pipeline and Hazardous Materials Safety Administration (PHMSA), Elbert County has seen a total of one serious hazardous materials incident between 1950 and 2021. PHMSA bases the definition of a "serious incident" on several factors including the type of materials released, if the release was a bulk quantity, and if there were injuries or fatalities. Evacuations of 25 or more people and the closure of major transportation arteries are also criteria for an incident to be recorded as serious.

The event listed for Elbert County, in Simla, was in 2013. A serious bulk release incident occurred as a vehicle accident / rollover and resulted in the release of 700 gallons of alcohols.

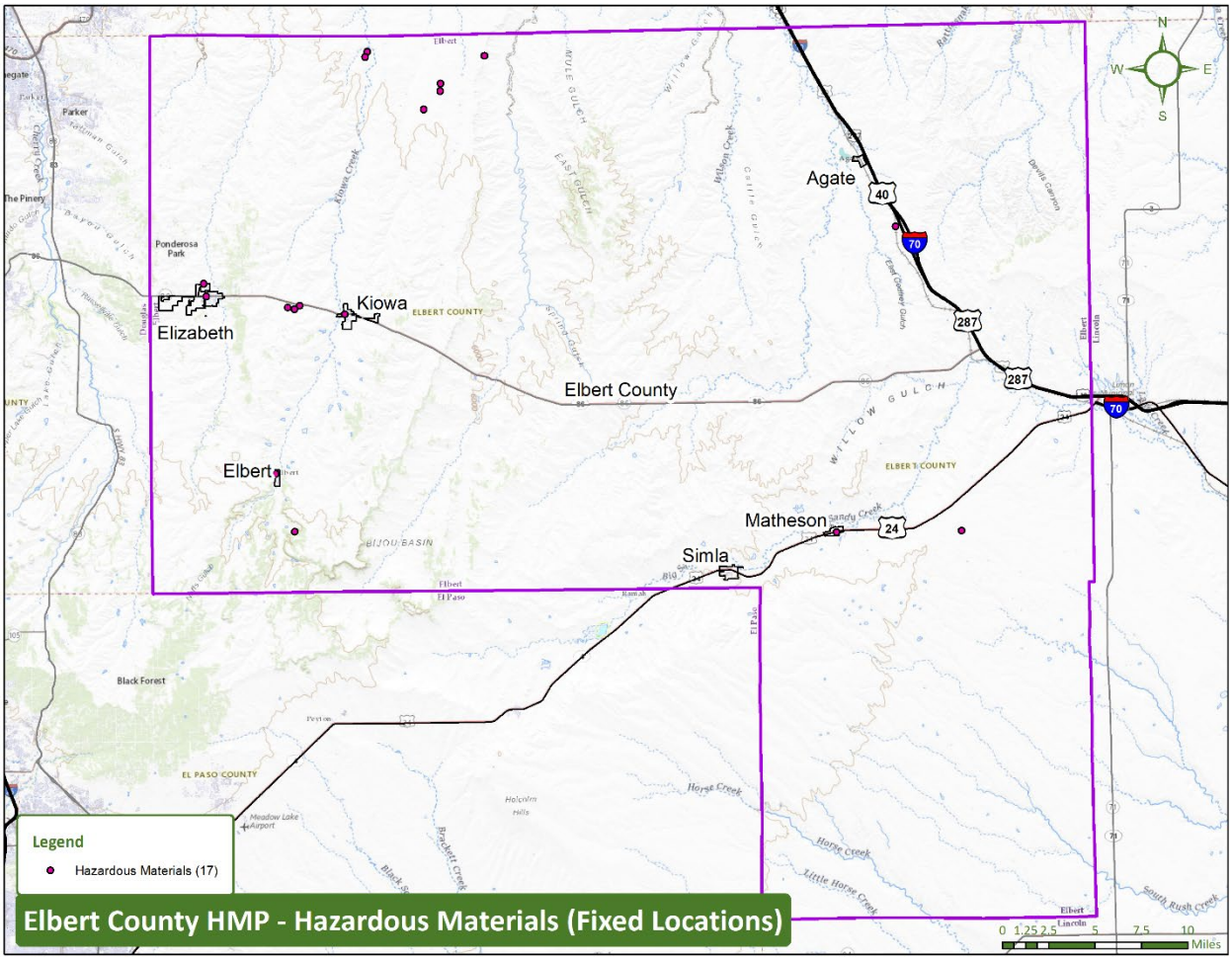
Location

Hazardous material releases can occur at the facility where they are being stored or utilized, as well as when materials are in transit via railway, highway, or pipeline.

There are 17 Tier II facilities in the county. A Tier II facility is a location where hazardous materials are stored and these facilities are monitored by the Environmental Protection Agency (EPA). Tier II facilities are required to complete an annual federal report to account for and track all hazardous materials stored at the site. This includes the maximum amount on site, average daily amount used, number of days material was present on-site, storage types, conditions, and locations. Health hazards of each reportable material are required, as well.

Figure 4.14 shows the locations of the Tier II facilities in Elbert County.

Figure 4.14 Elbert County Hazardous Materials- Fixed Locations

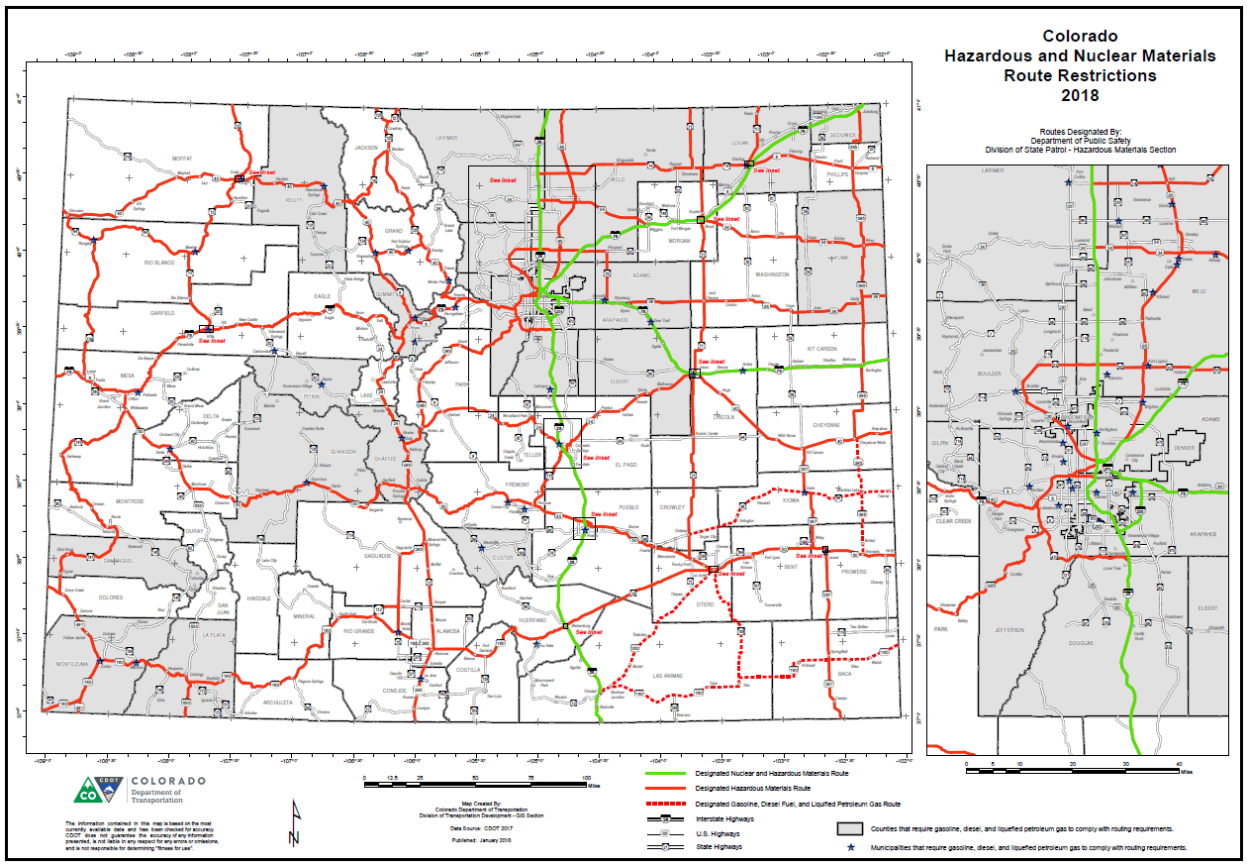


Frequency

In Elbert County, this type of event is rare, with the history of only one transportation release incident in seven decades. However, due to the state designated transportation routes and numerous fixed site facilities handling hazardous materials there is significant potential for an incident to occur. It is difficult to quantify or identify the hazardous materials being transported through the county on a daily basis, but according to the US Bureau of Transportation, in 2018, throughout the state of Colorado materials including basic chemicals and chemical products, fuel oils, crude petroleum and gasoline were transported approximately 14 billion ton miles. A ton mile is one ton of freight carried one mile reflecting the volume shipped and the distance shipped. This provides the best measure of physical volume of freight transportation services.

Figure 4.15 illustrates the routes over which these ton miles were traveled,

Figure 4.15 Colorado Hazardous Materials Route Restrictions (2018)



Severity

Severity of this hazard varies greatly as it depends on a variety of factors: the location of the release, whether in transport or fixed site, the proximity to the public and number of people affected, time of day, and potential impacts to waterways. The type of chemical released and how it releases, liquid or gas, determines if the chemical can be dispersed in the air. Weather conditions are another factor, as winds can carry hazardous gasses to communities nearby and precipitation can wash away materials that need to be remediated in specific ways.

Warning Time

Warning time for hazardous materials release is typically short, as human error causes a large amount of events and would not typically have a long onset. Incidents with materials in transport would also have a very short warning time, as an accident would happen with little to no time to react.

Secondary Hazards

A possible secondary hazard would be fire depending on the location of a facility or vehicle in transport, as well as the type of chemical and cause of the release. Contamination of a waterway could have public health impacts on safety depending on the amount of materials released, proximity to population, and how the water is utilized (recreationally or as drinking water). Air quality could also be impacted based on the type of chemical and nature of the release.

Exposure and Vulnerability

Lifelines

Multiple Lifelines can be impacted by a hazardous material release including Transportation, Food, Water & Shelter, and Health & Medical. Transportation is the most likely to be impacted as releases commonly happen in transit. These impacts are typically short term, causing transportation delays and road closures, but depending on the damage from the released material roads may need to be repaired.

Food, Water & Shelter can be impacted if a release contaminates a water supply, or soil, possibly affecting the long-term safety of crops. Evacuations are possible after a release in a populated area and can displace the public until the incident is handled, requiring sheltering resources.

Health & Medical can be impacted if a large group is affected by a release at the same time, putting a strain on specific hazardous material response equipment, medical personnel, and resources.

People

Exposure to a hazardous materials release can happen in a variety of ways, both direct and indirect. Facilities handling hazardous materials can have releases that greatly differ in size and complexity. Some releases may only put the handler or those in the immediate vicinity at risk. Other releases may require evacuations of the facility and possibly the surrounding area. Air quality can be impacted over great distances depending on the site, the type of hazardous materials, and the wind. If a release ends up in a waterway it can affect the population downstream, both recreational safety and drinking water quality.

The same is true for a release that happens in transit. Depending on the chemical, location, weather, and density of population nearby, a release can drastically vary in risk to the public.

Environment

Impacts from spills and releases can have long lasting effects. Soil and water contamination can occur, necessitating costly remediation. Animals and plants could also be impacted long term as a release can lead to unhealthy ecosystems.

Property

Property damage can be extensive and widespread depending on the release. At the facility, damages can include equipment, the building, and the surrounding area. Releases onto roadways can require recovering of the asphalt depending on the chemical damage, and release into soil or waterways can result in extensive costs due to necessary cleanup protocols. Equipment used for transit can be unusable after an incident, due to chemical or physical damage.

Economy

The economy would likely not be affected long term; however, if a release impacts transportation corridors, pipelines, or rail lines there could be a delay in important commodity transfer. Individual facilities may see an economic impact depending on the extent of the release which could disrupt or halt operations for an extended period. The clean-up costs could also impact the economy, locally and possibly regionally, as the size of the spill could necessitate multiple agencies responding, construction to repair damages, and the possibility of environmental remediation.

Future Trends in Development

Future population change across the county is expected to be 2.7% annually over the next decade. Vulnerability to hazardous materials releases will increase with any population growth, although structures are not expected to see any increased risk from these types of events.

Probability of Future Occurrences

The single reported serious transportation release incident in the county, since 1950, suggests the likelihood of a future incident is very low. However, hazardous materials release events are dependent on numerous variables, including weather and road conditions. Therefore, probability is difficult to assess based on the lone previous occurrence.

Climate Change Impacts

Climate change is not expected to greatly impact future hazardous material releases; however, anticipated increases in extreme precipitation events have the potential to cause more transport accidents.

4.10 Public Health Hazards

General Background

Public health hazards are those that can adversely impact the health and environment of a large number of people. These hazards can manifest as primary events by themselves such as epidemics and pandemics, or they may be secondary to another disaster or emergency such as a flood, severe thunderstorm, winter weather, or hazardous materials release incident. Environmental components of public health hazards that can affect the health of the community include air and water quality which can be affected by pollutants such as disease or smoke from a fire.

Public health hazards affect communities differently, based on the exposure to a hazard and the health and well-being of each resident. Many factors are looked at when determining risk for the public and individuals at the local level including the quality of health, the availability of clinical services, and the level and duration of exposure to a hazard.

Day-to-day operations in communities such as transportation, construction, and manufacturing can pose health risks, potentially affecting water and air quality. The public's proximity to hazardous materials facilities increases risk of exposure. Communities live with these risks every day; however, the hazards that garner the most attention are those that affect the population at a greater rate and to a greater extent such as disease outbreaks.

Disease outbreaks come in many forms, such as bacteria, viruses, and fungi, which can be spread through the air, water, and on surfaces. Outbreaks, including epidemics and pandemics, have the potential to cause serious illness, distress, and death, especially among those who have compromised immune systems due to age or underlying medical conditions.

Epidemics are disease outbreaks that typically only affect members of the local community and do not spread to other areas. A pandemic is an epidemic that spreads to a large population across country borders. These are most often caused by new subtypes of viruses or bacteria for which humans have little or no natural resistance. Consequently, pandemics typically result in more deaths, social disruption, and economic loss than epidemics.

Another public health issue is traumatic events, when a community has a shocking or distressing event which impacts physical, emotional, and psychological well-being. These events can have long-term impacts on the public and require support resources. It is important to recognize behavioral and mental health in the community, in day-to-day life and after an event, to better support the affected population.

Past Events

The 2019 Novel Coronavirus (COVID-19) which emerged in China in December 2019, caused a pandemic and impacted communities around the world. In Elbert County, the first COVID case presented on April 8th, 2020. As of this plan's writing the COVID-19 case count in Elbert County is 5,555 and there have been 45 deaths.

Currently, the COVID-19 pandemic has affected approximately 1,670,000 in Colorado, with over 13,500 deaths. Vaccines became available in December 2020 and over 73% of Coloradoans, roughly 4.15 million, are fully vaccinated.

The pandemic of the 2009-2010 Swine Flu (H1N1) was detected in the U.S. in April 2009. All 50 U.S. states reported cases of 2009 H1N1 by June 19th, 2009. A vaccine was created and distribution began in

the U.S. in October 2009. By the time the pandemic was declared over, on August 11th, 2010, Colorado saw 1,321 confirmed cases which resulted in 70 deaths. This virus caused 14,286 deaths worldwide and 2,117 laboratory-confirmed deaths in the U.S. according to the CDC.

Location

Public health hazards can occur anywhere. Epidemics can start anywhere in the world and rapidly become pandemics travelling across the globe. Water quality issues are possible in any community and the type of contamination can vary based on local uses, exposure to metals, minerals, and chemicals, and the possibility of a human-made contamination situation.

Air quality is affected by events both local and nationally, as wildfire smoke from western states can have direct impacts to Colorado.

Frequency

Globally, the frequency of pandemics is expected to increase as exposure to new viruses occurs around the world. While pandemics are expected to happen more often in the future, there is no way to predict when, where, or how a virus arises to infect people.

Water quality issues are not frequent but can be highly dangerous, even if rarely occurring. Drought has been shown to increase the concentration of heavy metals in drinking water.

Air quality issues are frequent as wildfires become more frequent and longer in duration, sending more smoke to far-reaching locations.

Severity

Severity of public health hazards is dependent upon many variables. For an infectious outbreak, the characteristics of the virus are crucial, as how fast it spreads and incubates, along with how deadly it is, can inform scientists and medical professionals of the best way to treat and eliminate it.

The more infectious it is, the larger the strain on healthcare and resources, as well as risk to the population which may rapidly become infected in large numbers. Other factors include the availability of a vaccine, personal protective equipment, and education about the virus, as well as the duration of the event.

Water quality issues can have severe consequences if contaminated or unsafe drinking water is utilized by large populations unknowingly. If boil orders or messaging not to drink the water are not sent out in a timely manner and via accessible communication methods, there is potential for many people to get sick.

Air quality has been shown to have long-term impacts on cardiovascular health, and what may seem like a random occurrence can be a lifelong issue with repeated exposure to pollutants.

Warning Time

The warning time for public health hazards depends on a variety of factors.

Water issues can have a rapid onset or a delayed impact, therefore a long period without warning could be dangerous if a water quality issue goes unnoticed. Air quality may have immediate or a one day warning time, depending on the type of pollutant and the weather. Wildfire smoke, for example, can alter the air quality drastically from one day to the next depending on winds.

For a pandemic, once a virus has become an epidemic somewhere in the world, surveillance begins through national and global public health organizations. In some cases, this may help to slow the spread of the virus and alert other countries and organizations of the risk of infection. Warning time can vary from a day to months, depending on how quickly a virus is discovered and the proximity of the discovered infection to the location of the initial outbreak. With modern global travel, a virus can be spread across the world in less than 24 hours.

Secondary Hazards

There are no immediate secondary hazards to public health issues.

Exposure and Vulnerability

Lifelines

Health & Medical is initially the most impacted Lifeline, as people who become ill from a public health hazard will seek medical attention. If a large number of people seek treatment, this can lead to a strain on the healthcare system which can affect treatment. In rural areas this may require transferring patients to other facilities, but if this option is not a feasible the person's care will be negatively impacted.

Other Lifelines that can be impacted by public health hazards are Food, Water & Shelter, as any issues with the quality of the water and possible outbreaks on certain crops can cause large groups to need medical attention. Foodborne disease outbreaks can also rapidly affect the health of a community.

People

Depending on the hazard, some of the population are more at risk of negative impacts. Those with chronic conditions such as diabetes, asthma, heart disease, and obesity can have difficulties with their body's response to an infectious disease. If there is a water quality issue, children may be more susceptible to the effects of the contaminant. It may be challenging for those with a low income, living in poverty, those with a disability, and the elderly to get the care and resources they need in a timely manner.

Traumatic events can affect everyone in the population, and the effects may present very differently from one person to the next. Awareness of the signs of someone struggling with mental health and emotional well-being can save lives if intervention occurs during a critical period.

Table 4.19 shows the characteristics of the populations across the county, compared to the state and the United States. These demographics and health indicators are used, along with numerous others, to determine the overall health of the population, as well as to gain an understanding of who may be at risk from different public health hazards.

Table 4.19 Demographic and Health Indicator Snapshot of Elbert County

Demographic	Unincorporated Elbert County	Colorado	United States
Population	27,128	5,812,069	331,449,281
Age: 4 and Under (%)	4.5	5.4	5.7
Age: Under 18 (%)	21.2	21.4	22.2
Age: 65 and Over (%)	18.1	15.1	16.8

Demographic	Unincorporated Elbert County	Colorado	United States
Persons in Poverty (%)	4.8	9.0	11.4
Persons with a Disability (%)	9.3	10.8	12.7
Persons Age 65+ with a Disability (%)	9.9	8.8	11.4
Adults who are Obese or Overweight (%)	63.9	57.4	71.3
Adults with Diabetes (%)	7.9	7.3	8.2
Adults with Asthma (%)	13.4	9.1	7.7
Adults with Coronary Heart Disease (%)	5.8	2.7	4.2

The entire population of Elbert County is susceptible to contracting a pandemic disease. While every disease is different, the oldest, youngest, and those with underlying medical conditions tend to be the most vulnerable to the effects of infection.

Less densely populated areas may benefit from reduced transmission, but there are often less resources to test and treat illnesses if the disease does spread into those rural communities.

Environment

Environmental impacts of public health hazards can be long standing such as a water quality issue affecting a large waterway and resulting in damage to ecosystems. Shorter term environmental impacts include air quality impacts from wildfires.

Property

Property is not likely to be affected by a public health hazard. In extreme cases, water quality issues could require remediation actions, such as updating pipes in individual homes or throughout a specific area.

Economy

The economy, regional and local, can be affected in a variety of ways due to public health hazards. In most cases, this is due to the need for operations to cease while a public health issue is addressed, such as water quality. In extreme cases, the shutting down of businesses can be used to regulate the transmission of a disease outbreak and can be in effect for extended periods. This results in impacts throughout the region, as intercounty commerce is an important part of the local economies. The drop in tourism due to a large public health event would also greatly affect the regional and local economies.

An indirect economic impact can be seen in loss of people in the workforce, as parents may need to stay home due to childcare and school closures. If people are leaving their houses less, shopping less locally and struggling with low income, the impact on the local economy may be seen in commodity and retail sales.

Future Trends in Development

As populations increase, the possible rate of transmission does as well. The more closely people interact, the more likely a disease is to spread. Water quality issues can also stem from new development, if infrastructure is not adequately installed, the materials are not of good quality, or if existing infrastructure is damaged during construction. The increase in wildfires seen around the country

contributes to air quality issues, with smoke capable of traveling great distances and affecting populations states away from the wildfire event.

Emotional and mental well-being should be a focus for all communities as they grow. A strong community can support each other during times of extreme stress and traumatic events. Building partnerships with local crisis support organizations makes resources available during times of need, as well as working closely with the public health department.

Probability of Future Occurrences

Public health hazards will impact the county in the future, whether infectious disease, air and/or water quality, or mental health needs. However, it is not practical or feasible to predict future occurrences.

Climate Change Impacts

Climate change has affected disease transmission globally, according to the World Health Organization. Temperature fluctuations and extreme weather events create conducive conditions for diseases to manifest and spread. The expected increasing number of disaster events will lead to more mass evacuations and need for more disaster sheltering, further increasing person-to-person interactions and impacting individual mental health.

4.11 Severe Weather (Hail, Lightning, Windstorm)

General Background

A thunderstorm is a rain event that includes thunder and lightning. A thunderstorm is classified as "severe" when it contains one or more of the following: hail with a diameter of three-quarter inch or greater, winds gusting in excess of 50 knots (57.5 mph), or tornado.

Hail

Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Eventually, the hailstones encounter downdraft air and fall to the ground. Colorado's damaging hail season runs from April through September. Hailstones can result in extreme damages, injuries and sometimes death. In 2019, the largest size hailstone record in Colorado was broken when a hailstone weighing over half a pound and 4.83 inches in diameter was discovered. The largest recorded hailstone in Elbert County was reported to be 4.5 inches and fell July 23rd, 1996, in Simla.

Lightning

Cloud-to-ground lightning is the most damaging and dangerous form of lightning. This type of lightning is particularly dangerous for several reasons. It is unpredictable and frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat.

U.S. lightning statistics compiled by the NOAA indicate that most lightning incidents occur during the summer months of June, July, and August and during the afternoon hours from between 2 and 6 p.m.

Windstorm

Damaging winds are classified as those exceeding 60 mph. Damage from such winds accounts for half of all severe weather reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. There are seven types of damaging winds:

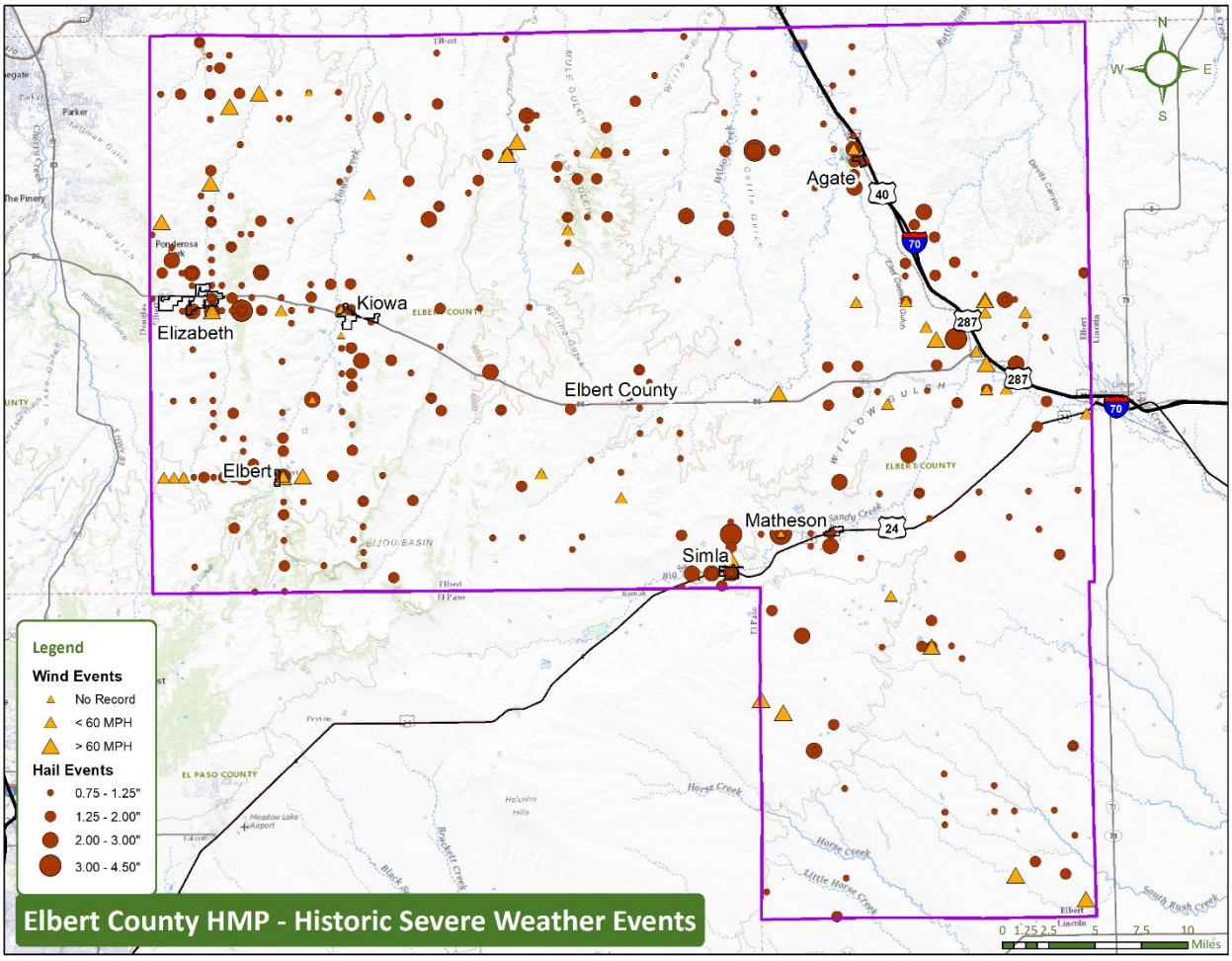
- Straight-line winds—Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- Downdrafts—A small-scale column of air that rapidly sinks toward the ground.
- Downbursts—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- Microbursts—A small, concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.

- Gust front—A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- Derecho—A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- Bow Echo—A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

Past Events

The historic severe weather events for the county are shown in Figure 4.16 and further information for specific events are shown in the following tables.

Figure 4.16 Elbert County Historic Severe Weather Events



Hail

Data from the NCEI shows 209 hail events in Elbert County from 1950-2021. Only two of these events are reported as causing property damages, a storm in Elbert on August 12th, 1993, and in Kiowa on July 3rd, 2008. Each caused $5,000 in damage and no crop damage, deaths, or injuries have been reported.

Incidents of hail are notably under reported, as well as the damages they may cause. Hail is typically reported in more densely populated areas and it is unknown how many occurrences may not be captured. Damages tend to be under reported as many people work with their insurance companies to cover costs and these amounts often do not get reported to weather event databases.

Table 4.20 shows the number of hail events organized by the size of the hail. There were 28 occurrences of hail two inches in diameter or larger, during the period measured which is the magnitude that the NWS considers Severe Weather.

Table 4.20 Hail Events by Hailstone Size (1950-2021)

Diameter (inches)	< 1.0	1.0 to 1.25	1.5 to 1.175	2.0 to 2.75	3	4.25	4.5
Number of Events	48	74	59	21	2	4	1

For reference, event narratives often use common objects to describe the size of hailstones. The following list illustrates this concept:

Diameter (inches)	**Common Object Reference**
< 1.0	dime, nickel
1.0 to 1.25	quarter
1.5 to 1.75	ping pong ball, golf ball
2.0 to 2.75	egg, tennis ball, baseball, pool ball
3.0	tea cup, large peach/apple
4.0	softball
4.5	grapefruit

The planning team and NCEI provided further information on past events. The narratives below are for reported notable hail events which were not reported with damage figures.

- July 1995: A wheat field was damaged as hail accumulated up to a foot deep
- June 1997: Hail/heavy rain event in southern Elbert County produced golf-ball sized hail, destroyed 18,000 acres of wheat crop, and washed out County Roads 185 and 197.
- August 1999: Golf ball size hail was reported 17 miles northeast of Kiowa, or about 7 miles northeast of Parker. Approximately 100 homes and 50 cars were damaged. In addition, minor flooding forced the temporary closure of Elbert County Road 194.

- June 2005: Large hail (baseball sized), in Agate, knocked holes into a porch roof and shattered all of the storm windows on the north side of a home.
- May 2007: Hail up to 2.5 inches in diameter was reported over southern Elbert County. Hail damage was reported in the towns of Elbert and Limon, where skylights and windows were broken.
- June 2007: Baseball-sized hail affected the Town of Elbert and resulted in many insurance claims
- July 2010: Large hail, ranging in size from quarters to baseballs fell in the county and the hail reportedly piled up to 8 inches deep in Elbert County. The largest hail of the thunderstorm event was observed in the county. Extensive damage was reported to vehicles near Interstate 70 and State Highway 86.
- July 2011: A severe thunderstorm produced hail up to golf ball size.
- June 2015: Baseball-sized hail affected northwest Elbert County and resulted in many insurance claims
- June 2019: Very large hail ranging from quarter to tennis ball size was reported. The largest hail fell across Douglas and Elbert counties. In Kiowa, skylights were reportedly shattered due to the hail.

Lightning

Table 4.21 lists reported lightning damage during the period from 1960-2021. It should be noted that this database captures only a small portion of damaging lightning events as most go unreported. Over this same period one fatality and seven injuries have been recorded. In 2015, the Town of Elizabeth had an estimated $50,000 in lightning-related damages. No additional information on the cost of property damage is known.

Table 4.21 Elbert County Reported Lightning Events (1988-2021)

Date	Location	Description
June 21, 1988	Elbert County	One fatality occurred
June 18, 1997	10 miles S-SW of Agate	Lightning struck an oil storage facility causing two tanks to explode into flames. A truck driver received minor injuries when he was knocked off a ladder from the explosion.
July 11, 2001	10 miles south of Kiowa	A 13-year old boy scout was knocked unconscious when lightning struck a tree near his tent.
June 22, 2014	Elizabeth	In Douglas and Elbert Counties, lightning sparked three fires in the vicinities of Franktown and Elizabeth in the span of ten minutes. Lightning struck an outbuilding south of Elizabeth, causing moderate damage to the contents inside. Lightning also struck a satellite dish at a home. $5,000 in property damages were reported.
2016	Central West Elbert County	Lightning damaged four houses within a neighborhood
June 6, 2019	Northeast Elbert County	Four men were struck by lightning, while another nearby was injured also.

Source: NCEI and Spatial Hazards Events and Losses Database for the United States (SHELDUS)

Windstorms

Based on best available data it was determined that there were 116 reported wind events affecting Elbert County from 1950-2021. These wind events were reported as high wind, strong wind, or thunderstorm wind events. The summary does not include winds that were part of winter storms. Table 4.22 lists events with notable damage descriptions or injuries.

Table 4.22 Wind Events Reported in Elbert County

Date	Location	Description
May 7, 1994	Elizabeth	Thunderstorm winds gusting to 70 miles per hour and blew out windows and damaged a storm door of a home in Elizabeth. Reported damages of $500.
June 12, 1994	Kiowa	Thunderstorm winds blew two metal sheds 300 yards near Kiowa. Several power poles snapped in two. Damages reported to be $5,000.
October 29, 1996	Northeast Colorado	One man was killed when a strong wind gust overturned a popup camper on him as he tried to secure it. Several trees and power lines were downed. Damages reported across affected counties of $5.2 million
July 27, 1997	Matheson	One injury
July 30, 1998	Elizabeth	Damaging thunderstorm winds, estimated to be at least 80 mph (70 kts) knocked over several 70-foot ponderosa pines. A 10-foot cement wall was also blown over and a garage door blown in.
April 8-9, 1999	Northeast Colorado	Windstorms caused damages across northeast Colorado. Damages were mostly broken fences, doors, and windows and crop damages. Multiple accidents occurred when tractor trailer rigs were blown on their sides. Blowing dust and dirt caused near zero visibilities closing sections of I-25 and I-76. Downed trees and power lines caused power outages and sparked a few grass fires. Damages across affected counties of $13.8 million.
August 18, 2000	Cedar Point	Thunderstorms producing wind gusts to 70 mph (60 kts) and large hail rumbled across northeast Elbert, northern Lincoln and southern Washington Counties. Strong winds caused three semi-trailers to roll over along Interstate 70. The drivers received minor injuries.
May 20, 2001	Northeast Colorado	Intense winds downed trees and power lines and caused zero visibilities due to blowing dust, dirt, and debris. Several vehicles were blown off I-70 west of Limon and I-76.

Date	Location	Description
May 21, 2002	Northeast Colorado	Very strong winds over northeast Colorado caused blowing dust and dirt reducing visibilities to less than a quarter of a mile. Damages to roofs, trees, and power lines were reported at several locations.
May 10, 2004	Simla	Strong thunderstorm winds downed two power lines and a power pole near the intersection of State Highway 86 and County Road 125 north of Simla.
May 2, 2008	Southeast Elbert County	Peak wind gusts in the mountains included 86 mph atop Niwot Ridge, and 85 mph at Berthoud Pass. Across the Urban Corridor and Northeast Plains, peak wind gusts included: 71 mph at the Natural Fort Rest Area, 69 mph at Briggsdale, 67 mph at Sterling, 65 mph at Wiggins, 63 mph at Bennett and Loveland, 60 mph at Limon and Mead, 58 mph at Watkins and 54 mph at Denver International Airport.
November 30, 2008	Northeast Elbert County	A storm system produced high winds over portions of the Northeast Plains. Peak wind reports included: 64 mph at Akron, 60 mph at Limon and 59 mph at Wiggins
January 19, 2009	Northeast Elbert County	The combination of strong winds and very dry conditions caused areas of blowing dust and dirt to create brownout conditions. As a result, visibilities were restricted to near zero along sections of I-70. Along the interstate near Genoa, eight passenger cars and six tractor-trailer trucks were involved in a collision. Two people were killed and at least 6 were injured, one seriously. The multi-vehicle collision forced the closure of the interstate for several hours. Damages of $250,000 reported.
March 24, 2009	Northeast Elbert County	Another round of strong winds occurred over the Northeast Plains of Colorado. Peak wind gusts included: 69 mph at Akron, 65 mph at Sterling, 62 mph at Bennett, 61 mph at Limon, and 60 mph at Holyoke.
August 4, 2009	Elbert	Intense thunderstorm winds knocked two power poles down at the intersection of County Roads 33 and 98. Damages reported at $5,000.
April 1, 2010	Northeast Elbert County	High winds developed over northeast Elbert and Northern Lincoln Counties. Peak wind reports included 64 mph at Limon Airport and 58 mph at Cedar Point.
April 13, 2010	Northeast Elbert County	High winds developed over portions of the Northeast Plains. Peak wind reports included: 69 mph, 2 miles east of Amherst and Highlands Ranch; 60 mph at Cedar Point, 58 mph at Holyoke and 57 mph at Kiowa.

Date	Location	Description
May 24, 2010	Northeast Elbert County	Very strong winds preceding a cold front swept across the Front Range Foothills, Urban Corridor and Northeast Plains. Peak wind gusts ranged from 60 to 85 mph. Numerous accidents were reported along Interstate 70 between Cedar Point and Limon. The strong crosswinds blew six semi-trucks and an RV on their sides; causing minor injuries and the temporary closure of the interstate.
April 3, 2011	Elbert County	High winds developed along the Front Range during the early morning hours. Peak wind gusts included: 92 mph, 7 miles northwest of Berthoud; 75 mph, 2 miles west of Castle Rock; and 65 mph, 2 miles west of Elbert.
April 14, 2011	Northeast Elbert County	High winds developed along Interstate 70 near Cedar Point where several gusts to 58 mph were observed
October 6, 2011	Elbert County	Strong winds developed across the northeast plains and Palmer Divide ahead of an approaching storm system. At the National Wind Technology Center, peak wind gusts ranged from 79 to 92 mph during the early morning hours. The high wind was more widespread further east. Sustained winds from 30 to 40 mph were common with peak winds gusts to 66 mph.
December 31, 2011	Northeast Elbert County	A fast moving upper level storm system, along with a deep low pressure system over Nebraska and high pressure building over Utah, combined to create a powerful windstorm across Northeast and North Central Colorado. In the mountains and foothills, several locations recorded wind gusts in excess of 100 mph. Numerous trees were knocked down throughout Arapahoe National Forest. One man was killed when he was impaled by a falling tree limb while driving along U.S. Highway 36.
March 18, 2012	Northeast Elbert County	A large upper-level trough over the Desert Southwest, combined with a deepening low pressure system over northeast Wyoming, to produce high winds across much of northeast Colorado.
March 30, 2014	Northeast Elbert County	On the evening of the 30th, high based showers and thunderstorms produced microburst winds over portions of northern Jefferson, eastern Boulder and southwest Weld Counties. Peak wind reports included: 77 mph at White Ranch Open Space; 72 mph, 2 miles north of Longmont; 67 mph, 1 mile south-southwest of Erie and Firestone; 60 mph, 3 miles south of Mead and 59 mph, 5 miles northwest of Henderson.
April 27, 2014	Northeast Elbert County	High winds developed across the northeast plains of Colorado as a strong storm system passed from southeastern Colorado into northwestern Kansas. Peak wind gusts included: 73 mph, 4 miles east of Haxtun; 66 mph at Akron and Sterling Municipal Airport; 65 mph at Holyoke; and 61 mph at Limon and Strasburg

Date	Location	Description
April 29, 2014	Northeast Elbert County	High winds continued east of Interstate 25. Peak wind reports included: 77 mph at Akron Airport and Sterling; 69 mph at Limon Airport; 68 mph at Denver International Airport; 62 mph, 4 miles north of Elizabeth.

Source: NCEI and SHELDUS

Location

Hail, lightning, and windstorms can occur anywhere in Elbert County and pose a similar risk to all local governments. FEMA's Wind Zones in the United States Map shows Elbert County located in Wind Zone II with expected extreme winds of up to 160 mph.

Frequency

Thunderstorms, including both lightning, hail, and high wind events, happen every year in Elbert County. It is highly likely that severe weather will strike somewhere in the county in any given year.

Severity

Hail can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from resulting damages. Hail has been known to cause injury to humans and occasionally has been fatal. Research has shown that damage occurs after hail reaches around 1" in diameter and larger. Hail of this size will trigger a severe thunderstorm warning from NWS.

High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Windstorms in Elbert County are rarely life threatening but do disrupt daily activities and cause damage to buildings and structures. Winds can also cause trees to fall creating a hazard to property and individuals.

Lightning is one of the more dangerous weather hazards in the United States and in Colorado. Each year, lightning is responsible for deaths, injuries, and millions of dollars in property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning can cause forest and brush fires, as well as deaths and injuries to livestock and other animals. According to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States each year. The institute estimates property damage, increased operating costs, production delays, and lost revenue from lightning and secondary effects to be in excess of $6 billion per year. Impacts can be direct or indirect. People or objects can be directly struck, or damage can occur indirectly when the current passes through or nearby.

Warning Time

Meteorologists can often predict the likelihood of a severe thunderstorm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may come on more quickly and have only a few hours of warning time.

Secondary Hazards

The most significant secondary hazards associated with severe storms are floods, debris flow, falling and downed trees, landslides, and downed power lines. Rapidly melting snow combined with heavy rain can

overwhelm both natural and manmade drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Fires can occur as a result of lightning strikes. Many locations in the county have minimal vegetative ground cover and the high winds can create a large dust storm which becomes a hazard for travelers and a disruption for local services. Debris carried by high winds can also result in injury or damage to property. A wildland fire can be accelerated and rendered unpredictable by high winds.

Exposure and Vulnerability

Lifelines

All Lifelines exposed to flooding are also likely exposed to risks associated with thunderstorms and hail. Those on higher ground may also be exposed to wind damage and all are at risk at damage from falling trees. The most common problems associated with these weather events are loss of utilities, which falls under the Energy and Communications Lifelines. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water, and sewer systems may not function. Roads may become impassable due to secondary hazards such as flooding and landslides. Lightning events can have destructive effects on power and information systems. Failure of these systems would have cascading effects throughout the county.

People

It can be assumed that the entire planning area is exposed to thunderstorm, hail, high wind, and lightning events. Areas of greater exposure are where higher population densities exist. Certain areas are more exposed due to geographic location and local weather patterns. Populations living at higher elevations, with large stands of trees or power lines may be more susceptible to wind damage and blackouts, while populations in low-lying areas are at risk for possible flooding. It is not uncommon for residents living in more remote areas of the county to be isolated after such events.

Populations with Access and Functional needs, including the elderly, those with low income, linguistically isolated populations, people with mobility issues, and residents living in areas that are isolated from major roads may see more impacts from severe weather events. Power outages can be life threatening to those dependent on electricity for medical support. Isolation of these populations is a significant concern. Those working outdoors or recreating in the area are more vulnerable to severe weather events.

Environment

The environment is highly exposed to thunderstorms, hail, high wind, and lightning. Natural habitats risk major damage and destruction. Prolonged rains can saturate soils and lead to slope failure. Flooding events can produce river channel migration or damage riparian habitat. Lightning may ignite wildfires.

Property

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. The effects of winds are magnified in the upper levels of multi-story structures. As positive and negative forces impact the building's protective envelope (doors, windows, and walls), the result can be roof or building component failures and considerable structural damage.

All buildings are considered exposed to the thunderstorm, hail, high wind, and lightning hazards, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

Economy

Economic impact from thunderstorm, hail, high wind, and lightning hazards is possible, as damage to property, crops and livestock may result in losses. This can occur in any events for these hazards; however, events with large hail have been known to cause the death of livestock and devastate crops. High wind events are also extremely damaging to crops. The losses suffered from a harvest ruined by hail or high wind, or the death of livestock, can affect the local economy.

In addition, disruption of Lifelines and daily operations due to damaged infrastructure and facilities can cause losses. Repairing, rebuilding, or replacing critical equipment may be a slow process which could have cascading effects on businesses and the local economy. Any extended delay of returning to normal functioning has the potential to close businesses and impact industry.

Future Trends in Development

All future development will be affected by severe storms. The vulnerability of community assets to thunderstorms is increasing through time as more people enter the planning area. The ability to withstand impacts lies in consistent enforcement of codes and regulations for new construction.

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is vital to mitigating hazard impacts on new development. Adopting and enforcing the most recent building codes will ensure new development can deal with the impacts of severe weather events. Land use policies enforced through zoning code and the permitting process also address many of the secondary impacts (flood and landslide) of the severe weather hazard.

Probability of Future Occurrences

Severe weather events will continue to occur each year in Elbert County. It is more difficult to predict how often damaging events will occur.

Based on NCEI data, hail will occur in a given year, as data shows an average of almost three events per year, during the period of record. In addition, the number of hail events is likely higher, due to the under reporting of hail which reinforces this probability. Lightning will occur in the county, and based on past events, the probability of a damaging lightning event is approximately 10% annual chance. Best available data for reported windstorm events, suggests an event will occur in a given year, while reported damaging windstorm events have an approximate 37% chance of occurring in a given year.

Climate Change Impacts

Climate change presents a significant challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. Historical data shows that the probability for severe weather events increases in a warmer climate. The changing hydrograph caused by climate change could have a significant impact on the intensity, duration, and frequency of future thunderstorm events. All of these impacts could have significant economic consequences.

4.12 Severe Winter Weather

General Background

Winter storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Elbert County receives varying amounts of snow throughout the area. The annual average snowfall is 60.5 inches. The higher elevation areas of the county near the Palmer Divide can experience much greater snowfall.

Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on municipalities.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until damage can be repaired. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibilities to only a few feet in areas where there are no trees or buildings, as well as close highways. Serious vehicle accidents can result in injuries and deaths. Winter winds can also induce avalanches.

Extreme cold often accompanies a winter storm, or is left in its wake, and is most likely to occur in the winter months of December, January, and February. Prolonged exposure to the cold can cause frostbite and hypothermia, as well as become life-threatening. Wind chill is the dangerous combination of wind and cold temperatures and is based on the rate of heat loss from exposed skin. A wind chill watch is issued by the NWS when wind chill warning criteria are possible in the next 12 to 36 hours. A wind chill warning is issued for wind chills of at least -25°F on the plains.

Past Events

Based on NCEI data, there have been 137 severe winter weather events in Elbert County which includes blizzard, winter storm, and winter weather events. Table 4.23 highlights notable events from 1996 – 2021.

Due to the regional nature of weather events, reports often refer to large areas, and for Elbert County this includes the Palmer Divide. The Palmer Divide is an area of elevated land between Denver and Colorado Springs that stretches across Douglas and Elbert Counties. It extends as far east as Limon and parts of Lincoln County. Cities and towns on the Palmer Divide include Parker, Castle Rock, Elizabeth, Kiowa, Black Forest, and Monument.

NCEI began recording winter weather events in 1996 and records prior to that time are limited. However, accounts of the worst storm affecting the region, prior to 1996, was a blizzard in 1913 which occurred December 1st through the 5th. Over 45 inches of heavy, wet snow fell in Denver, halting tramcars for a week and requiring approximately 4,000 men to dig the tracks out. Automobiles were immobilized and had to be towed out by horses, while roofs collapsed around the city. Snow totals around the state, based on data from the Colorado Climate Center, included 86 inches in Georgetown; 53 inches in Estes Park; 44 inches in Boulder; 34 inches in Fort Collins; and 24 inches in Colorado Springs. The benefits of this storm included a bountiful crop harvest for the 1914 crop year, valued at $115 million, and establishing a precedent for snow load building codes for future construction.

In addition, the HMPC recalled that sometime during the 1940s severe winter weather caused problems with starving livestock resulting in mass burials.

Table 4.23 Severe Winter Weather Events

Date	Description
April 13, 1996	Blizzard conditions developed over northeast Colorado, with winds from 25 to 50 mph, cold temperatures, and heavy snowfall. Snow drifts 3-4 feet tall were reported. One on the most heavily hit areas eastern Elbert County. Snowfall in Kiowa was 6-9 inches. Icy roads and reduced visibilities in blowing and drifting snow resulted in multiple vehicle accidents.
October 24, 1997	Deadly blizzard conditions across all of eastern Colorado brought snowfall totals along the Urban Corridor and adjacent plains generally ranging from 14 to 30 inches. Sustained winds to 40 mph (35 kts) with gusts as high as 60 mph (52 kts) caused zero visibilities and deadly wind chill temperatures to dip between 25 below and 40 below zero. In some areas, the blizzard stirred up snowdrifts ranging from 4 to 10 feet in depth. Several major highways and interstates were closed as conditions became life threatening and travel impossible. Red Cross shelters were set up for hundreds of travelers who became stranded and were forced to abandon their vehicles. The deaths of four people resulted, directly and indirectly, from the blizzard. In Weld County, 3,000 cattle died. Elizabeth was recorded as having 32 inches of snow.
December 8, 1997	Snowfall and high winds caused eastern Elbert County to be impacted by extensive blowing snow. Sections of Interstates 25 and 70 were closed, along with several other roads and highways and roads, as travel became impossible in the blowing snow. Several people were stranded. Snowfall total was eight inches at Kiowa.
March 17-19, 2003	The storm began on St. Patrick's Day and had storm totals between 10 and 87 inches across 20 counties in the state over three days. The mayor of Denver said, "This is the storm of the century, a backbreaker, a record breaker, a roof breaker." The heavy wet snow caused roofs of homes and businesses to collapse across the Urban Corridor. The snow also downed trees, branches, and power lines. Up to 135,000 people lost power at some point during the storms and it took several days, in some areas, to restore power. A total of 25 inches of snow fell in Elbert County causing major road closures and shutting down operations. Across the affected areas, the storm damaged over 250 homes and had overall total reported damages of $15.5 million; however, other estimates place this at over $93 million.
March 31, 2005	A strong spring storm brought near blizzard conditions east and southeast of Denver. Extensive blowing snow caused near zero visibilities and snow drifts from two to four feet.
October 25, 2006	A storm brought heavy snow to the Interstate 25 Corridor and Palmer Divide. Snowfall was 16 inches near Kiowa and 15 inches near Elizabeth. Strong winds caused blowing and drifting snow with snow drifts up to four feet. The heavy wet snow caused extensive tree damage and downed power lines and power outages.

Date	Description
December 18-22, 2006	A slow moving, low pressure system moved from the Desert Southwest and into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. Strong winds and heavy snow brought blizzard conditions to the Interstate 25 Corridor, from the Wyoming state line south to Colorado Springs. Storm totals generally ranged from 2 to 4 feet in and near the Front Range Foothills and Palmer Divide. Across the Northeast Plains and in high mountain valleys of North and Middle Parks, storm totals ranged from 1 to 2 feet. Strong winds gusting from 40 to nearly 60 mph during the storm produced drifts from 6 to 12 feet deep. Police and National Guardsmen rescued hundreds of commuters stuck in their cars and sent them to temporary shelters set up by the Red Cross. All highways and interstates, including I-25, I-70 and I-76 were shut down. Public assistance was granted for 16 counties, including Elbert. FEMA Snow Declaration EM-3270-CO. A $77,076 claim was filed.
December 8, 2006	A slow moving system with blizzard conditions developed over portions of the Northeast Plains of Colorado, mainly south of Interstate 76. The heaviest snow fell along east facing slopes with storm totals up to 2.5 feet in the North Central Mountains and Front Range Foothills. Across the Interstate 25 Corridor storm totals ranged from 6 to 18 inches, heaviest near the Front Range Foothills and Palmer Divide. In the Northeast Plains, storm totals ranged from 3 to 6 inches. Strong winds and snow brought blizzard conditions to plains of eastern Colorado, forcing the closure of Interstate 70 as well as several other roads and highways. Whiteout conditions were reported across eastern portions of Adams, Arapahoe, and Elbert Counties, as well as Lincoln, Phillips, and Washington Counties.
January 21, 2007	Heavy snow fell along the Front Range Foothills, Urban Corridor and Northeast Plains accompanied by 20 to 30 mph winds. In and near the Palmer Divide, storm totals ranged from 6 to 15 inches. Across the Northeast Plains, storm totals ranged from 2 to 11 inches. Very strong winds, produced extensive blowing and drifting snow along the Interstate 70 corridor, from just east of Denver to near Limon. Sustained winds from 30 to 45 mph were measured near Cedar Point with peak gusts to 60 mph. As a result, snow drifts 2 to 4 feet in depth made some roads impassable with whiteout conditions reported. Interstate 70, from Airpark Road to Burlington, and State Highway 86, near Cedar Point, were closed due to very poor driving conditions. Snowfall of 12.5 inches was reported in Elizabeth.
April 24, 2007	Blizzard conditions and 12 inches of snow caused power outages for five days.
April 16, 2008	A storm system brought heavy snow to parts of the North-Central Mountains, Front Range Foothills and Palmer Divide. The heaviest snow fell mainly south of the Interstate 70 Corridor. Storm totals in the mountains and foothills ranged from eight to nearly 15 inches. Across the northern portions of Douglas, Elbert, and Lincoln Counties, storm totals ranged from four to nine inches.

Date	Description
October 20, 2009	Heavy snow developed along the Palmer Divide and eastern Colorado as a storm system tracked across southern Colorado and northern New Mexico. Storm totals included: 15 inches, 15 miles north of Elizabeth, 14 inches at Agate, 13 inches, 14 miles west-southwest of Agate; 11 inches, 2 miles east of Elizabeth. Storm totals elsewhere range from three to five inches. Approximately 70 power poles were knocked down during the storm.
March 19, 2010	A late winter season storm brought heavy snow to areas in and near the Front Range. Storm totals included: 11 inches, 6.5 miles southwest of Castle Rock and 9 inches, two miles east of Elizabeth.
March 23, 2010	A powerful spring snowstorm swept across North Central and Northeast Colorado. In and near the Front Range Foothills, storm totals ranged from one to two feet. Elsewhere, storm totals ranged from five to 10 inches. The heavy, wet snow clung to power lines and tree limbs, causing 36,500 outages to homes and businesses throughout the Denver metro area. Power outages were also reported in Douglas and Elbert Counties. Storm totals included 14 inches, two miles east of Elizabeth.
December 30, 2010	Another winter storm brought moderate to heavy snow, strong winds and very cold wind chill temperatures to the mountains, foothills and northeast plains of Colorado. The strong winds and heavy snow produced blizzard conditions over the far northeast plains. Peak wind gusts ranged from 30 to 45 mph and produced extensive blowing and drifting snow along with whiteout conditions. Across the Urban Corridor, storm totals included six inches at Boulder and two miles north of Loveland; and five inches, two miles east of Elizabeth. In the mountains and foothills, storm totals generally ranged from five to 10 inches.
May 11, 2011	A spring snowstorm brought heavy snow to the mountains, foothills and Palmer Divide. The heaviest snowfall occurred in the Front Range Foothills and Palmer Divide where storm totals included: 12 inches, four miles northwest of Elizabeth; and 10 inches, 10 miles north of Elizabeth.
October 25, 2011	A powerful early season storm brought heavy snow to the Front Range and adjacent plains. The heavy, wet snow caused extensive downed large branches and in some cases, entire trees. Massive power outages occurred from Fort Collins and Greeley south to Denver and the surrounding metro area. Fort Collins, Loveland, and Greeley were hit the hardest by the event. No snow totals available for Elbert County.
November 1, 2011	A storm system brought another round of moderate to heavy snow to the region. Areas in and near the Front Range Foothills and Palmer Divide were hit the hardest with anywhere from 8 to 14 inches. Heavy snow was also observed over parts of the northeast Colorado plains, where storm totals ranged from 4 to 10 inches. Gusty winds also produced blizzard conditions along the Cheyenne Ridge and Palmer Divide. Poor road conditions forced the closure of Interstate 25, from Wellington to the Wyoming state line. Snow drifts, from 1 to 3 feet deep were reported in the northern portion of Douglas and Elbert Counties. Storm total of 11 inches, 9 miles north-

Date	Description
	northeast of Elizabeth.
December 21, 2011	Large scale lift from an upper level low combined with a deep easterly upslope flow behind a cold front to produce heavy snow in and near the Front Range Foothills and Palmer Divide. In Elbert County, storm totals included 13.5 inches, 15 miles north of Elizabeth, and 11 inches, 4 miles northwest of Elbert.
February 2, 2012	A slow moving and powerful storm system brought heavy snow to areas in and near the Front Range Foothills, with blizzard conditions over the northeastern plains of Colorado. In the Front Range Foothills, the snow piled up to over 4 feet in some areas. Across the Palmer Divide, the combination of snow and gusty winds resulted in road closures with snow drifts ranging from 2 to 5 feet in depth. Northerly winds 15 to 25 mph were common with gusts to 40 mph. Road closures included State Highway 86, between Kiowa and I-70. Storm totals in Elbert County included 26 inches, 14 miles east-northeast of Kiowa; 25 inches, 16 inches at Agate; 12 inches near Elizabeth.
February 23, 2012	Bands of moderate to heavy snow, associated with a strong upper level jet, formed over the southern Front Range Foothills, Palmer Divide, and southern Denver suburbs. Storm totals included: 10 inches, two miles west- northwest of Highlands Ranch and Kiowa.
February 24, 2013	A storm system near the Four Corners region produced heavy upslope snowfall in and near the Front Range with blizzard conditions further east as it made its way across southern Colorado. Along and south of the I-70 corridor, east of Denver to around Cedar Point, the combination of heavy snow and strong wind produced blizzard conditions. Storm totals included 8 inches at Elizabeth and 7 inches at Agate. Northerly winds of 25 to 30 mph were common with gusts to 40 mph. Interstate 70 was especially hazardous from around Byers to Limon where snow and blowing snow reportedly produced zero visibilities at times and drifts up to 3 feet deep.
February 26, 2013	A storm system moving through the region produced heavy snow in the Front Range Foothills. As the system moved into the east central plains of Colorado, snow and blowing snow produced blizzard conditions along and south of the Interstate 70 corridor, from just east of Denver to the Kansas state line. Storm totals generally ranged from 3 to 7 inches. North winds of 25 to 30 mph were reported with gusts around 40 mph. Roads became impassable as snow and blowing snow produced 3 to 4 ft snow drifts. Road and highway closures included: Interstate 70 from Aurora to the Kansas state line.

Date	Description
March 9, 2013	A storm system brought heavy snow to areas in and near the Front Range Mountains and Foothills, with blizzard conditions over parts of the northeast plains of Colorado. Across the Palmer Divide and northeast plains of Colorado, storm totals ranged anywhere from 2 to 10 inches. The combination of snow and strong wind produced blizzard conditions and forced the closure of Interstate 70 east of Denver. Across the affected areas, sustained winds of 25 to 35 mph with gusts to 45 mph produced near zero visibilities at times and snow packed roads. Snowdrifts from 2 to 4 feet deep were reported. As a result, many of the roadways became impassable.
March 22, 2013	A wet, early spring snowstorm brought heavy snow to parts of the Front Range Foothills, Urban Corridor, and Northeast Plains. The heaviest snowfall occurred near the Front Range Foothills and Palmer Divide. Near blizzard conditions forced the closure of Interstate 70 east of Denver to the Kansas state line along with many roads in the northeastern plains of Colorado. Agate had a reported storm total of 9 inches.
April 8, 2013	Heavy snow developed in and near the Front Range Foothills and Palmer Divide as an upper level trough made its way across southern Colorado. Snowfall was enhanced locally with the presence of an upper level jet. Elsewhere, periods of light to moderate snow along with areas of blowing snow were observed. A storm total of 7.5 inches, 14 miles west-southwest of Agate was reported. The combination of snow and strong winds produced drifts from one to three feet deep were reported over eastern Elbert County.
April 2, 2014	A storm system brought moderate to heavy snow to portions of the Front Range Mountains, Foothills, and Urban Corridor. Storm totals in the mountains and foothills included seven inches in Simla.
May 11, 2014	A strong storm system moved from southwest Colorado and produced heavy snow over the Front Range and adjacent plains. The snow was heaviest over the Front Range foothills where up to 2.5 feet of snow was observed.
November 16, 2015	A Pacific storm system moved out of the Four Corners region and into southeast Colorado and resulted in blizzard conditions over parts of east central Colorado. The Palmer Divide south and southeast of Denver was hit the hardest. Numerous road closures occurred south and southeast of Denver, including both directions of Interstate 70 from E-470 to Limon because of windy and whiteout conditions. Storm totals were reported at 19 inches, 4 miles west-northwest of Elizabeth. Peak wind gusts included 49 mph in Kiowa and 47 mph at Elbert. Snowdrifts 4 to 6 feet in depth were reported near Elizabeth.
December 15, 2015	A fast moving but potent Pacific storm system moved into southeast Colorado. It then produced a deep upslope that brought heavy snow to the areas in and near the Front Range Foothills, Palmer Divide, and northeast plains. The combination of moderate to heavy snowfall and gusty winds caused roads to get snow packed with drifts 1.5 to

Date	Description
	four feet deep in spots. Storm totals for Elbert County not available.
February 1, 2016	The combination of heavy snow and strong winds produced extensive blowing and drifting snow along the Palmer Divide and across the northeast plains of Colorado. Snowdrifts from three to six feet deep were observed. Numerous roads and highways were closed east of the Interstate 25, including I-70 and I-76 respectively overnight, as the roadways became impassable. Schools were closed for three days and emergency services were disrupted. Storm totals included 21 inches, 4 miles northwest of Elizabeth and 12 inches at Agate
March 23, 2016	Blizzard conditions closed major roadways throughout Elbert County. Many motorists were stranded, shelters were opened, and emergency services were disrupted.
March 24, 2017	An intense but fairly fast moving system that developed over southeastern Colorado brought a brief period of blizzard conditions along the Palmer Ridge south and southeast of Denver. Strong wind gusts from 45 to 60 mph accompanied the snow. Storm totals ranged from 7 to 11 inches and included 5 inches near Simla. The blizzard conditions forecast the closure of schools, roads and highways over Douglas and Elbert Counties. Interstate 70 was closed between Airpark and Limon in both directions for several hours and State Highway 86, from Kiowa to Limon was also closed. Several vehicles were stranded due to drifting snow, ranging from 2.5 ft to 8 ft, and zero visibilities.
April 28, 2017	A storm brought totals ranging from 5 to 25 inches along the Front Range Foothills and along the Palmer Divide. In Elbert County, 12.5 inches were reported near Elizabeth.
January 1, 2019	A winter storm system brought a mix of strong winds with pockets of moderate to heavy snow to the southern Front Range Foothills and Palmer Divide; with blizzard conditions along I-70 east of Aurora. Interstate 70 was closed in the morning through early afternoon on the 22nd, from the exit at Denver International Airport to the Kansas state line. Parts of major highways including I-25 south of Denver toward Monument and Highway 24 were also closed for several hours. Numerous accidents along I-70 were reported due to strong winds and low visibility of a quarter mile or less. Strong northerly winds gusting from 45 to 55 mph were observed. Six inches of snowfall was observed in Agate.
March 13, 2019	A rapidly intensifying storm system or bomb cyclone brought hurricane strength winds to the northeast plains of Colorado, along with moderate to heavy snowfall. Peak wind gusts ranged from 60 to 80 mph. Thundersnow produced snowfall rates up to 3 inches per hour just west of Denver. At Denver International Airport, a non-thunderstorm wind gust of 80 mph broke the previous record of 63 mph set in Match

Date	Description
	13, 2009. Snowfall amounts ranged from 2 to 6 inches near the base of the foothills, with up to 20 inches in the mountains and foothills. Along the Palmer Divide east of I-25 and the northeast plains of Colorado, storm totals ranged from 4 to 10 inches. Widespread outages, multi-vehicle accidents and road closures prompted the governor to declare a state of emergency which activated the Colorado National Guard to assist state and local authorities in rescuing hundreds of stranded motorists. Disaster declarations included the following counties and cities: Adams, Arapahoe, Douglas, Elbert counties, as well as the city of Aurora. Multiple accidents included a 100-car pileup on Interstate 25, from MM 285 to the WY border; with another 100-car accident south of Denver toward Monument. A state trooper was struck and killed on Interstate 76. Road closures included: Interstate 70 from Denver Airport to Limon, and from Golden to Idaho Springs; I-25 from South Denver to Monument Hill; I-76 closed from northeast Denver to Nebraska. Nearly 1400 flights in and out of Denver International Airport that were canceled due to the blizzard. Five thousand passengers were stranded at the airport. The number of people who lost power during the storm totaled 445,000. Xcel energy called over 500 employees work to restore power with additional 300 out-of-state workers on their way to assist. Approximately 85,000 people, mostly in the Denver area, were without electricity the following day. At least 335 vehicles were stuck and abandoned on Interstate 25 near Larkspur. In Denver, 250 vehicles were abandoned during the storm. School buses were used to rescue stranded drivers. At least 33 public school districts were closed on the 13 and 14th. Warming centers and shelters opened area wide.
October 29, 2019	A strong storm system dropped out of the northern Rockies and across Colorado. This system brought record breaking temperatures and up to a foot of new snow to parts of Denver, especially across the south and southeast portions of the metro area down to the Palmer Divide. The combination of snow and wind along the Interstate 70 corridor east of Denver forced its closure in both directions for several hours due to drifting snow and poor visibility. Storm totals for Elbert County included 8 inches near Elizabeth, and 6 inches, 4 miles east of Elbert.
November 25, 2019	A powerful winter storm brought very heavy snowfall to the Front Range Mountains, Foothills, I-25 corridor and northeast plains. Heavy snow developed in and near the Front Range Foothills of Larimer and Boulder counties, then spread south and east across the rest of the region. Schools closed across the affected areas. I-76 and I-70 northeast and east of Denver were closed for 10 and 7 hours respectively. Reported storm totals included 8 inches in Agate, 16 inches, 5 miles north of Elizabeth and 12 inches near Elizabeth.

Date	Description
March 19, 2020	A powerful storm system brought blizzard conditions to the northeast plains of Colorado. The storm system produced 9 inches in Agate and peak wind gusts to 56 mph which resulted in extensive blowing and drifting snow, along with whiteout conditions. Numerous roads closures were posted east of Interstate 25 and over the Palmer Divide. Highways closings included portions of eastbound interstates 70 and 76 in eastern Colorado due to strong winds and whiteout conditions. I-70 was also closed westbound into the mountains, due to heavy snow and numerous accidents. Across portions of the northeast plains of Colorado, blizzard conditions were observed. Storm totals ranged from 3 to 9 inches. Peak wind gusts included: 63 mph in Akron, 56 mph in Limon, 51 mph in Fort Morgan and 49 mph in Greeley and at Denver International Airport.

Location

Severe winter weather events can occur over large geographical areas. All of Elbert County may be affected by winter weather of various durations and extent of area. With multiple crucial transportation routes traversing the county, included Interstate 70, State Highway 86, US Route 24, and 30 miles of Union Pacific rail line, the impacts of winter weather can have far reaching effects. Whether it is travelers, commuters, or transportation of goods, potentially including hazardous materials, winter weather events can jeopardize public safety.

Frequency

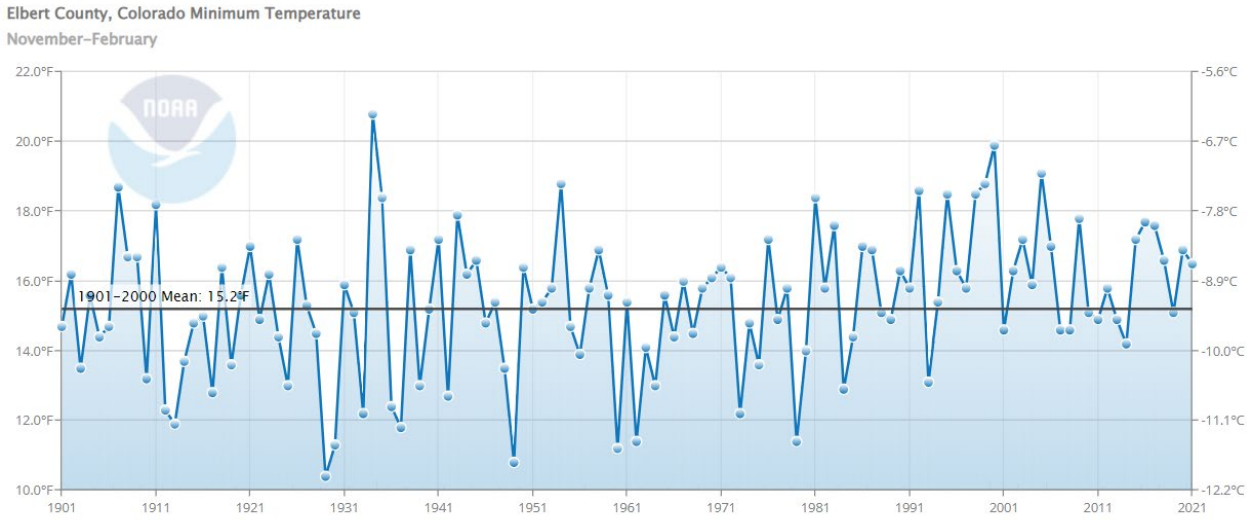
Winter weather will occur each year across the county; however, the severity is determined by a variety of conditions and is therefore difficult to predict. Severe winter weather events have occurred as early as October and as late as May in the county.

Severity

Severity of winter weather varies greatly depending on numerous factors, including temperatures, precipitation type, wind conditions, time of day, location, and exposure to the elements affecting public safety. Figure 4.17 uses NCEI data to show the overall average minimum temperature in the county, between November and February, from 1901 to 2021. The average minimum temperature recorded for the county between 1901 and 2000, for the same months, is 15.2°F.

The largest negative deviation from the average was in 1929, when the minimum temperature for the November to February period was 10.4°F. In 1934, the largest positive deviation resulted in the average minimum temperature for those months being recorded at 20.8°F. The last two decades, the negative deviations from the average temperature have been notably smaller, all 8 during the period were less than 1°F. The remaining 13 recorded deviations were positive and fell between 0.6°F and 3.9°F.

Figure 4.17 Average Minimum Temperature 1901-2021 (November – February)



Since severe winter weather typically spans extended geographical areas, utilizing the thorough data from NCEI / NOAA observation stations in Castle Rock and Limon is the most comprehensive way to view the overall climate of the county. The Castle Rock station has been collecting data since 1893 and the Limon station since 1948. The Byers observation station data is included along with Castle Rock and Limon in the following graphics, Figure 4.18 through Figure 4.20. The graphics show the similar trends in weather at the stations over time, illustrating a realistic assumption of the similarity of weather for Elbert County in between. The blue line represents the observed temperatures in each location from 2021 (2019 for Byers) and the light blue shows the record minimum temperatures recorded.

Using a National Weather Service tool, NOWData, it is possible to highlight specific days and see more detailed information about the date a maximum or minimum temperature occurred, including the typical temperature range and the observations of a chosen year.

The NCEI data shows the lowest temperature recorded in Castle Rock is -32°F on January 7, 1913. In Limon, the lowest temperature recorded is -27°F on February 15, 2021. In Byers, the lowest temperature on record is -36°F on February 8, 1936.

Figure 4.18 Daily Temperature Data – Limon, CO (August 1948 – July 2022)

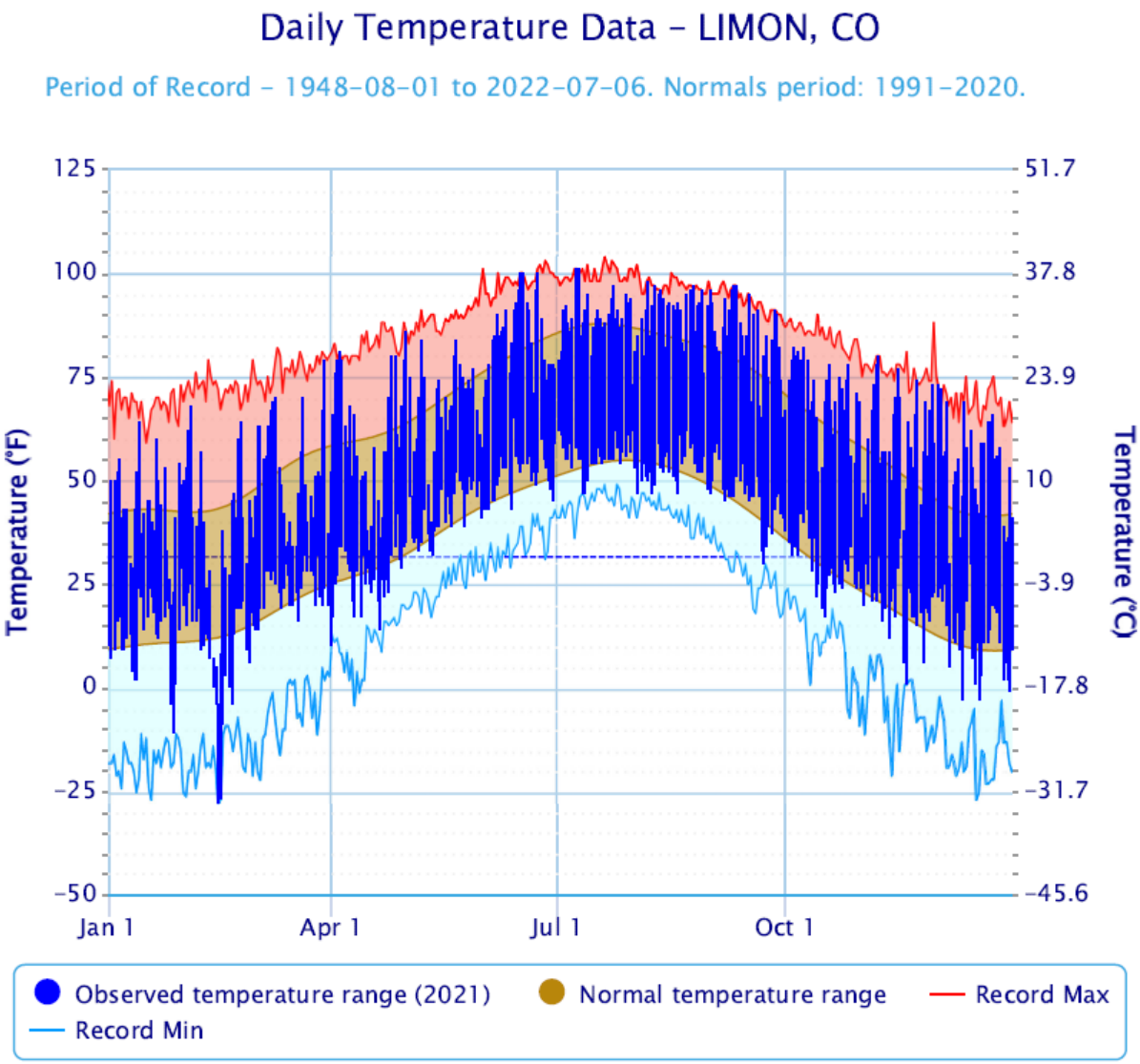


Figure 4.19 Daily Temperature Data – Castle Rock, CO (January 1893 – July 2022)

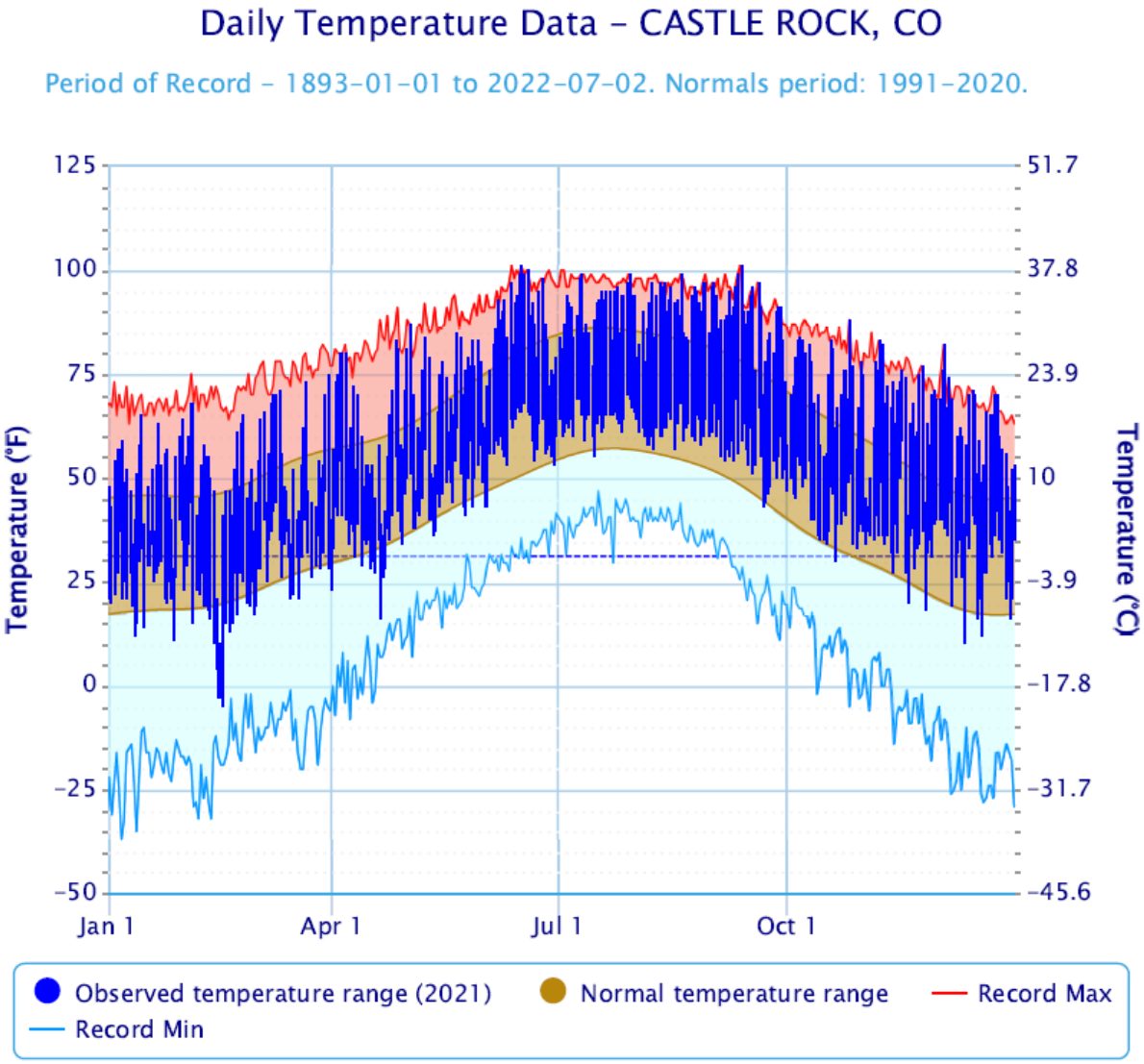
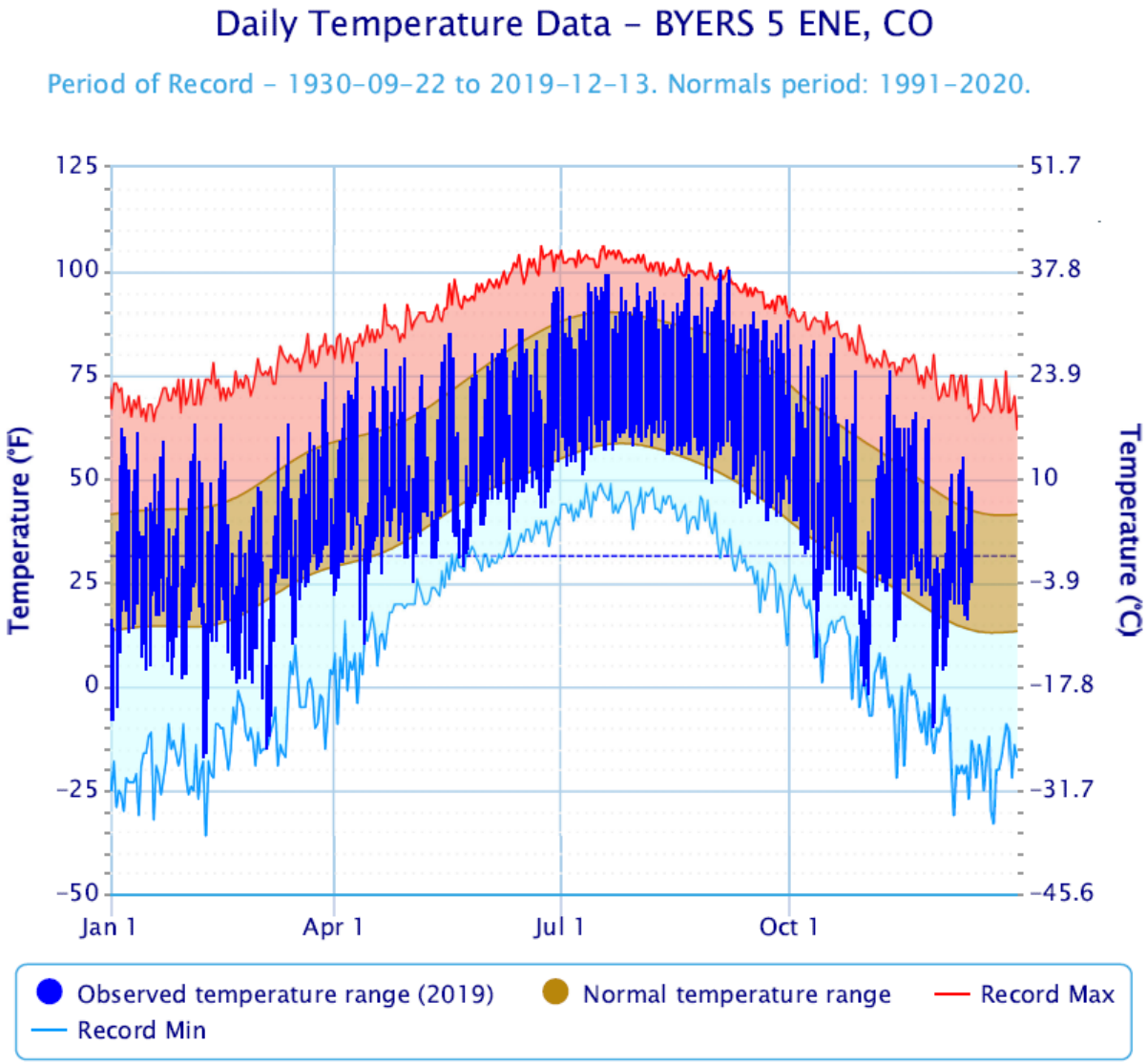


Figure 4.20 Daily Temperature Data – Byers, CO (September 1930 – December 2019)



The largest, historical snow totals according to available NOAA data for Elbert County can be seen in Table 4.24, with the station and year reported.

Table 4.24 Largest Historical Snow Totals

COOP Station	Year	Snow Total (Inches)
Elizabeth 2 NW	1997	119.8
Kiowa 4 SW	1959	132.4
Elbert 4 SSW	1959	113.2
Elbert 3 SE	1959	112.6
Elbert 4 SSW	1957	108.9

Warning Time

Meteorologists can often predict the likelihood of a severe winter storm. When forecasts are available, they can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may come on more quickly and have only a few hours of warning time.

Secondary Hazards

The most significant secondary hazards associated with severe winter storms are falling and downed trees, landslides, and downed power lines. Rapidly melting snow combined with heavy rain can overwhelm both natural and manmade drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Additionally, the storms may result in closed highways and blocked roads. It is not unusual for motorists and residents to become stranded. Annually, heavy snow loads and frozen pipes cause damage to residences and businesses. Late season heavy snows will typically cause some plant and crop damage.

Exposure and Vulnerability

Lifelines

Severe winds, downed trees, and ice accumulation can create serious impacts on Energy and Communications infrastructure, including power lines and above-ground communication lines. Freezing of power and communication lines can cause them to break, disrupting electricity and communication. Loss of electricity and phone connection would leave certain populations isolated, as residents would be unable to call for assistance. Extreme cold can disrupt or impair communications facilities.

Transportation Lifeline failures, due to loss and interruption of roadway capacity, are a secondary hazard often most associated with severe winter weather. Roads may become impassable due to ice or snow accumulation which create dangerous driving conditions. Availability of county roads to move people and supplies throughout the region is also a concern.

These types of events can significantly impact the transportation system and the availability of public safety services. Of particular concern are roads providing access to isolated areas and to those with access and functional needs (AFN). Prolonged obstruction of major routes can disrupt the shipment of goods and other commerce.

People

The populations most likely to suffer the negative effects of severe winter weather events are motorists who may be stranded, those participating in outdoor recreation activities and those with AFN.

AFN populations include the elderly, children, people with chronic health and mobility issues, those with independent living difficulty, low income families, non-English speaking residents, and those who live in areas that are isolated from major roads. These populations face isolation and exposure during severe winter weather events and could suffer more secondary effects of the hazard. Power outages can be life threatening to those dependent on electricity for medical equipment or other health needs.

The use of fuel-burning heaters indoors and the potential of poisoning and asphyxiation also poses a significant risk to the population of the county.

Environment

The environment is highly exposed to severe weather events. Natural habitats such as streams and trees risk major damage and destruction. Flooding events caused by snowmelt can produce river channel migration or damage riparian habitat.

Property

All buildings in the county are exposed to severe winter weather, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. Those that are located under or near overhead lines, or near large trees may be vulnerable to falling ice or may be damaged in the event of a tree or limb collapse. The frequency and degree of damage will depend on specific locations.

Economy

Negative economic impact from severe winter weather is possible. Damage to property, crops, and livestock can result in costs, both direct and indirect. Direct costs for the value lost and indirect costs for the loss of work that comes from harvest and livestock transport, as well as the overhead that may result during repair or reconstruction of properties.

Short term impacts may occur if roads and businesses must close, affecting transport and commerce and can have a negative effect for an entire region. Routes which have substantial impact if closed include Highways: 86, 13, 166/Singing Hills, Kiowa-Bennett Rd, and County Line Rd, which are typically closed in pairs or groups. Closure of Interstate 70 is also a significant disruption in transportation. The impacts of road closures for the county are related to both emergency responder access and the ability of community members to acquire goods and services from their local businesses and grocery stores.

Future Trends in Development

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is crucial to public safety as growth continues and development increases. Adherence to these existing building codes and including adoption of more recent codes by Simla will ensure construction is more likely to withstand a severe winter weather event.

Public education is critical as new residents move to the area. Many may not have experienced a winter weather event and will not know how to be prepared. Educating the population on this hazard and how to minimize risk from events will prove beneficial for the county.

Probability of Future Occurrences

Severe winter weather will occur in the county and based on historical data will happen at least annually. The severity of these events is the difficult aspect to specify, as each storm has unique characteristics and numerous factors will dictate the ultimate impacts.

Climate Change Impacts

Climate change presents a significant challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century and historical data shows that the probability for severe weather events increases in a warmer climate. The changing hydrograph, caused by climate change, could have a significant impact on the intensity, duration, and frequency of storm events. All of these impacts could have significant economic consequences.

4.13 Tornado

General Background

A tornado is a narrow, violently rotating column of air that extends from the base of a cumulonimbus cloud to the ground. The visible sign of a tornado is the dust and debris that is caught in the rotating column made up of water droplets. Tornadoes are the most violent of all atmospheric storms. The following are common ingredients for tornado formation:

- Very strong winds in the mid and upper levels of the atmosphere
- Clockwise turning of the wind with height (i.e., from southeast at the surface to west aloft)
- Increasing wind speed in the lowest 10,000 feet of the atmosphere (i.e., 20 mph at the surface and 50 mph at 7,000 feet.)
- Very warm, moist air near the ground with unusually cooler air aloft
- A forcing mechanism such as a cold front or leftover weather boundary from previous shower or thunderstorm activity.

Tornadoes can form from individual cells within severe thunderstorm squall lines. They also can form from an isolated super-cell thunderstorm. Weak tornadoes can sometimes occur from air that is converging and spinning upward, with little more than a rain shower occurring in the vicinity.

Tornadoes are classified based on the damage inflicted once it has passed over a manmade structure which allows experts to assess and estimate wind intensity. The Fujita Scale (Table 4.28) was used until 2007, classifying the intensity from the least to most intense, in seven categories (F0-F6). This scale was replaced by the Enhanced Fujita Scale which uses six intensity categories (EF0-EF5) to measure tornado strength and associated damages. The scale was revised to reflect better examinations of tornado damage surveys, to align wind speeds more closely with associated storm damage. The new scale takes into account how most structures are designed and is considered a more accurate representation of the surface wind speeds in the most violent tornadoes.

Table 4.25 provides details on how the Enhanced Fujita Scale intensities were derived from the previous Fujita Scale.

Table 4.25 Derived EF Scale

Fujita Scale		Derived EF Scale	
F Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	45-78	**0**	65-85
1	79-117	**1**	86-109
2	118-161	**2**	110-137
3	162-209	**3**	138-167
4	210-261	**4**	168-199
5	262-317	**5**	200-234

Past Events

The NCEI Storm Events Database lists 125 tornado events, 27 of which have reported damages, between 1950 and 2021. Based on best available data from NCEI, there are some events with damages reported, but without costs listed. These are included in Table 4.27, to give an accurate representation of the effects of tornadoes on the county and its communities.

The highest rating of tornadoes in the county has been F3, occurring on June 6th, 1990. This event resulted in three fatalities and was reported to have caused $2,500. Table 4.26 shows the breakdown of the ratings for reported tornadoes in the county between 1950 and 2021. These are separated based on the change of rating scale in 2007, from the Fujita Scale to the Enhanced Fujita Scale. There is one event that did not have a rating and is therefore unable to be listed.

Table 4.26 Ratings of Reported Tornadoes in Elbert County

Fujita Scale		Enhanced Fujita Scale	
Rating	Number of Events	Rating	Number of Events
F0	48	**EF0**	42
F1	24	**EF1**	5
F2	3	**EF2**	2
F3	1	**EF3**	-

Historic tornado events in the county are shown in Figure 4.21, along with the F / EF rating. Reported damaging events are highlighted in Table 4.27.

Figure 4.21 Elbert County Historic Tornado Events

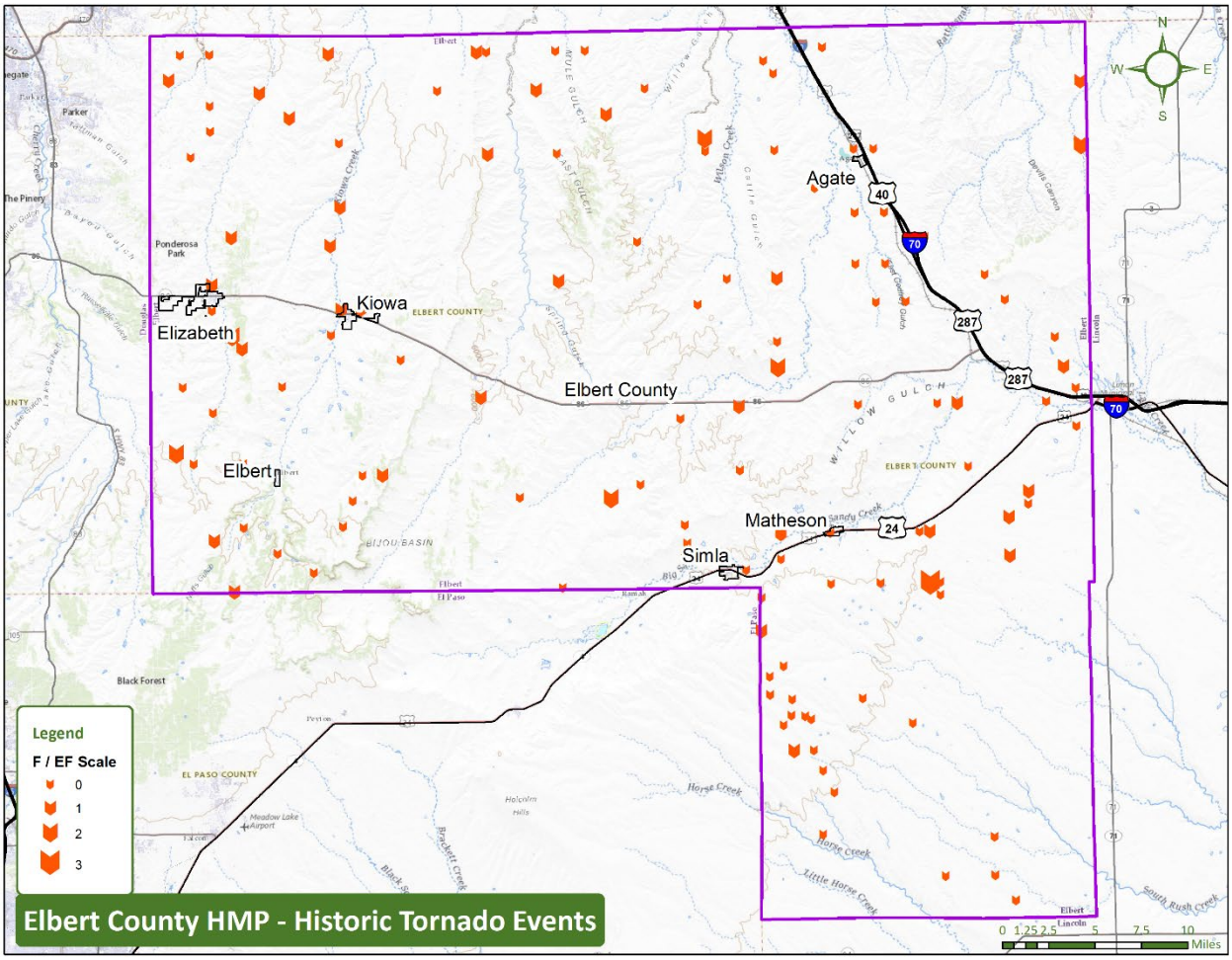


Table 4.27 Damaging Tornadoes Reported in Elbert County

Date	Magnitude	Description	Damages
July 13, 1978	**F0**	One barn was unroofed, another metal barn was damaged, and a camper trailer was overturned. Rain from the thunderstorm resulting in a hotel basement flooding and evacuations. Mud and gravel slides covered some of the roads nearby.	**Unavailable**
June 19, 1980	**F1**	Details unavailable.	**$2,500**

Date	Magnitude	Description	Damages
June 4, 1983	**F2**	A large tornado touched down near Elizabeth, moving east northeast to the north of Kiowa. Two mobile homes and a shed were damaged as they were lifted off the ground, in one case 2 ft off of the foundation. Approximately $70,000 worth of timber was destroyed on a ranch, snapping and leveling trees. A few power poles were destroyed.	**$250,000**
June 6, 1990	**F3**	A 500-yard wide tornado touched down 12 miles southwest of Limon and traveled approximately 7 miles. The tornado tracked northeast, producing 1-3 inch within a half an hour and destroyed three cow trough windmills near the junction of US Highway 24 and County Rd 169. It dissipated 5-6 miles west of Limon. There were three fatalities.	**$2,500**
July 19, 1995	**F0**	Near Agate a tornado ripped shingles off the roof of a house and the doors off a barn. A nearby wheat field was damaged as hail accumulated up to a foot deep. No estimate of damage was provided.	**Unavailable**
May 10, 2004	**F2**	A tornado touched down and severely damaged two farmsteads. The first farmstead was struck approximately 10 miles north-northwest of Simla. One tree was knocked over by the tornado. One cow was killed, another was severely injured and had to be destroyed. An unoccupied ranch house on a neighboring farmstead, about 11.5 miles north of Simla, was also destroyed. The tornado picked up the modular home and its contents and dumped it about 500 feet away from the farmstead. In addition, a calving shed and a two-story barn built in 1925 were destroyed. A pig, lamb and dog were killed. The twister also picked up and scattered a dozen trucks, farm vehicles and cars on the farmstead. This event impacted Agate, Cedar Point, Matheson, and Simla	**Unavailable**
May 10, 2004	**F1**	A tornado touched down near Matheson and caused extensive damage to a barn.	**Unavailable**
June 15, 2004	**F1**	Three homes in Rattlesnake Fire District (near Elizabeth) had debris damage. A tornado touched down causing roof damage to a home and destroyed a barn. Two other barns on nearby properties were extensively damaged. Significant tree damage was also reported.	**Unavailable**

Date	Magnitude	Description	Damages
June 22, 2006	**F1**	Damage to trees and house on Badger Lane. House under construction off Painthorse Circle was demolished.	**Unavailable**
August 24, 2008	**EF0**	Two confirmed tornado touchdowns caused minor damage to one residence and damaged power lines about 10-14 miles north of Elizabeth.	**$5,000**
June 7, 2009	**EF1**	A tornado touched down in unincorporated Elbert and damaged a home, several outbuildings, and injured some horses. This was one of nine tornadoes that touched down from metropolitan Denver to SE Aurora.	**Overall damages for all reported tornado events - $75,000**
June 15, 2009	**EF1 and EF2**	Near Elizabeth, an EF1 caused minor damages to two homes, then intensified to EF2 causing damages to a farm, trees, and snapping power poles. An airplane hangar was damaged, and a small place was flipped. The tornado leveled a 70-year-old barn and tore open a nearby cinderblock shed. The tornado had a total travel path of approximately 20 miles, all south-southwest of Elizabeth.	**$100,000**
July 29, 2009	**EF0**	Resolis, Elbert County. Several power poles were completely removed from the ground, knocking out electrical power. Some trees and a home were also damaged.	**$75,000**
July 12, 2011	**EF0**	Cedar Point and Fondis, a tornado touched down briefly and knocked down approximately 20 large ponderosa pines.	**Unavailable**
June 7, 2012	**EF2**	Simla, a tornado caused moderate to severe damages to numerous homes and farm buildings in southern Elbert County. One person suffered minor injuries.	**Unavailable**
June 4, 2015	**EF0 - EF1**	Fondis, Simla, Kutch and Matheson were involved in a tornado event with 16 touchdown locations. Four homes suffered severe damage, two of which were uninhabitable. An additional two homes suffered moderate damages, a further eight were reported to have slight damages.	**Unavailable**

Date	Magnitude	Description	Damages
June 5, 2015	**EF1**	In Elizabeth, a tornado collapsed a roof structure, as well as damaging an outbuilding and some fencing. Some trees were snapped at their base.	**Unavailable**
June 27, 2018	**EF1**	In Elizabeth, a tornado touched down briefly and uprooted several trees.	**Unavailable**

There were 10 tornadoes between 1951 and 1983, with reported damages between $30 and $250 USD. The ratings ranged from F0 to F2. These are not included in the table above due to lack of event information and the low reported damages.

Location

Tornadoes may occur anywhere in the county.

Frequency

Tornadoes have been reported nine months of the year in Colorado, with peak occurrences between mid-May through mid-August. State-wide, June is the month with the most recorded tornadoes. Tornadoes occur at all times of the day, with more than half occurring between 3 p.m. and 6 p.m., and about 88 percent occurring between 1 p.m. and 9 p.m.

Severity

If a major tornado were to strike within the populated areas of Elbert County, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed.

Historically, tornadoes have not typically been severe or caused damage in the planning area. Table 4.28 presents the damages associated with the various F Scales and this is a reference for understanding of the types of damage experienced from past tornado events. The currently utilized Enhanced Fujita scale uses a multipoint system based on damages after the event to better categorize tornadoes.

Table 4.28 Fujita Scale (F-Scale)

F-Scale	Intensity Phrase	Character	Wind Speed	Type of Damage
F0	Gale Tornado	Weak	40-72 mph	Light Damage. Some damage to chimneys; branches broken off trees, shallow-rooted trees pushed over, sign boards damaged.

F-Scale	Intensity Phrase	Character	Wind Speed	Type of Damage
F1	Moderate Tornado	Weak	73-112 mph	Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off road; attached garages may be destroyed
F2	Significant Tornado	Strong	113-157 mph	Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe Tornado	Strong	158-206 mph	Roofs and some walls torn from well- constructed houses; trains overturned; most trees in forested area uprooted; heavy cars lifted and thrown.
F4	Devastating Tornado	Violent	207-260 mph	Well- constructed houses leveled; structures with weak foundations blown off some distance; cars thrown, and large missiles generated.
F5	Incredible Tornado	Violent	261-318 mph	Strong frame houses lifted off foundations, carried considerable distances, and disintegrated; automobile sized missiles airborne for several hundred feet or more; trees debarked; steel reinforced concrete structures badly damaged

F-Scale	Intensity Phrase	Character	Wind Speed	Type of Damage
F6	Inconceivable Tornado	Violent	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably be unrecognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

Warning Time

NOAA's storm prediction center issues tornado watches and warnings for Elbert County:

- Tornado Watch - Tornadoes are possible. Remain alert for approaching storms. Watch the sky and stay tuned to NOAA Weather Radio, commercial radio, or television for information.
- Tornado Warning - A tornado has been sighted or indicated by weather radar. Take shelter immediately.

Once a warning has been issued, residents may have only a matter of seconds or minutes to seek shelter.

Secondary Hazards

Tornadoes may cause loss of power if utility service is disrupted. Additionally, damages to natural gas infrastructure may cause fires and interrupt distribution. Hazardous materials may be released if a structure housing such materials is damaged or if such a material is in transport. Public health may be impacted if water and wastewater facilities are affected.

Exposure and Vulnerability

Lifelines

All Lifelines are exposed to tornadoes. The most common problems associated with this hazard are utility losses, which falls under the Energy and Communications Lifelines. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water, and sewer systems may not function. Communication infrastructure may be affected by an event, creating issues with dispatching first responders, keeping the public informed, and requesting aid and supplies.

Tornadoes can cause significant damage to trees and power lines. The Transportation Lifeline can be impacted if debris caused by tornadoes blocks roads, incapacitates transportation corridors, isolates populations, and disrupts ingress and egress. Of particular concern are roads providing access to isolated areas and to those with access and functional needs (AFN).

Any facility that is in the path of a tornado is likely to sustain damage and medical or sheltering facilities sustaining damages could have cascading impacts for the community.

People

It can be assumed that the entire planning area is exposed to tornadoes. Populations requiring extra assistance during an event are those with AFN, including children, the elderly, those with low income, linguistically isolated populations, people with chronic illnesses, and residents who lack transportation or are living in areas that are isolated from major roads.

Power outages can be life threatening to those dependent on electricity for medical equipment and support. These populations face isolation and exposure after tornado events and could suffer more secondary effects of the hazard.

Individuals caught in the path of a tornado who are unable to seek appropriate shelter are especially at risk. This may include individuals who are out in the open, in cars, or those who do not have access to basements, cellars, or safe rooms.

Environment

Environmental features are exposed to tornado risk, although damages are generally localized to the path of the tornado. If tornadoes impact facilities that store hazardous materials, the surrounding areas may be especially vulnerable to a release.

Property

All property is vulnerable during tornado events, but properties in poor condition or manufactured housing are at the highest risk.

Economy

Tornadoes may have a devastating impact on the economy. The factors of what sustains damages such as property, crops, or livestock and the extent of the damage dictates the level of impact. In the case of less intense tornadoes which may touch down only briefly, damage might be minimal and limited in losses. However, even a lower intensity tornado that touches down and travels can leave a path of destruction and extensive damages in its wake.

High intensity tornadoes which can destroy structures in a matter of seconds, can leave a community with significant rebuilding which may take an extended duration. These periods of rebuilding are likely to have a negative impact on the strength of the economy, as businesses remain closed and Lifelines services may be disrupted.

Future Trends in Development

All future development can be affected by tornadoes. The vulnerability of community assets is increasing through time as more people enter the planning area. The ability to mitigate impacts lies in consistent enforcement of codes and regulations for new construction.

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is crucial to public safety as growth continues and development

increases. Adherence to these existing building codes and including adoption of more recent codes by Simla will ensure construction is more likely to withstand a tornado event.

Future population change across the county is expected to increase rapidly over the next decade. Over the next ten years, a 2.7% annual increase is projected. As these areas are at a larger risk to future tornadoes, future development is expected to increase the risk to this hazard.

Probability of Future Occurrences

Probability of future occurrences for tornado events is reliant on the reported data, but it should be taken into consideration there may be a number of tornadoes that are not spotted and therefore not reported. Based on the best available data, it is likely that Elbert County will see further tornado events. The probability of a damaging tornado event is 24% chance in a given year. The 71 year period of records, between 1950 and 2021, showed a total of 17 tornadoes with damages reported. Around half of these damaging tornadoes were an F1 or EF1 rating, and a quarter were F0 or EF0, suggesting the likelihood of smaller tornadoes continuing to cause damage in the future. Tornadoes with impacts on people and / or property are of the most concern and assessing probability with consideration of the factors of risk and historical impact data is important.

Climate Change Impacts

Climate change impacts on the frequency and severity of tornadoes are unclear. According to the Center for Climate Change and Energy Solutions, “Researchers are working to better understand how the building blocks for tornadoes – atmospheric instability and wind shear – will respond to global warming. It is likely that a warmer, moister world would allow for more frequent instability. However, it is also likely that a warmer world would lessen chances for wind shear. Recent trends for these quantities in the Midwest during the spring are inconclusive. It is also possible that these changes could shift the timing of tornadoes or regions that are most likely to be hit”.

4.14 Wildfire

General Background

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson.

Fire hazards present a considerable risk to vegetation and wildlife habitats. Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long- term effects include impacts to water supply, secondary hazards, smaller timber harvests, reduced access to affected recreational areas, and destruction of community infrastructure, as well as cultural and economic resources. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as wildland urban interface (WUI) areas, where development is adjacent to densely vegetated areas.

Wildfires do not affect communities equally. Populations with health and mobility issues, those who lack resources whether financial or transportation, and those with communication barriers, are disproportionately impacted at all stages: preparedness, response, and recovery. Recognition of the diverse needs of a community is critical to life safety and begins with planning and education. Identifying and giving a voice to these populations will create more inclusive and relevant plans.

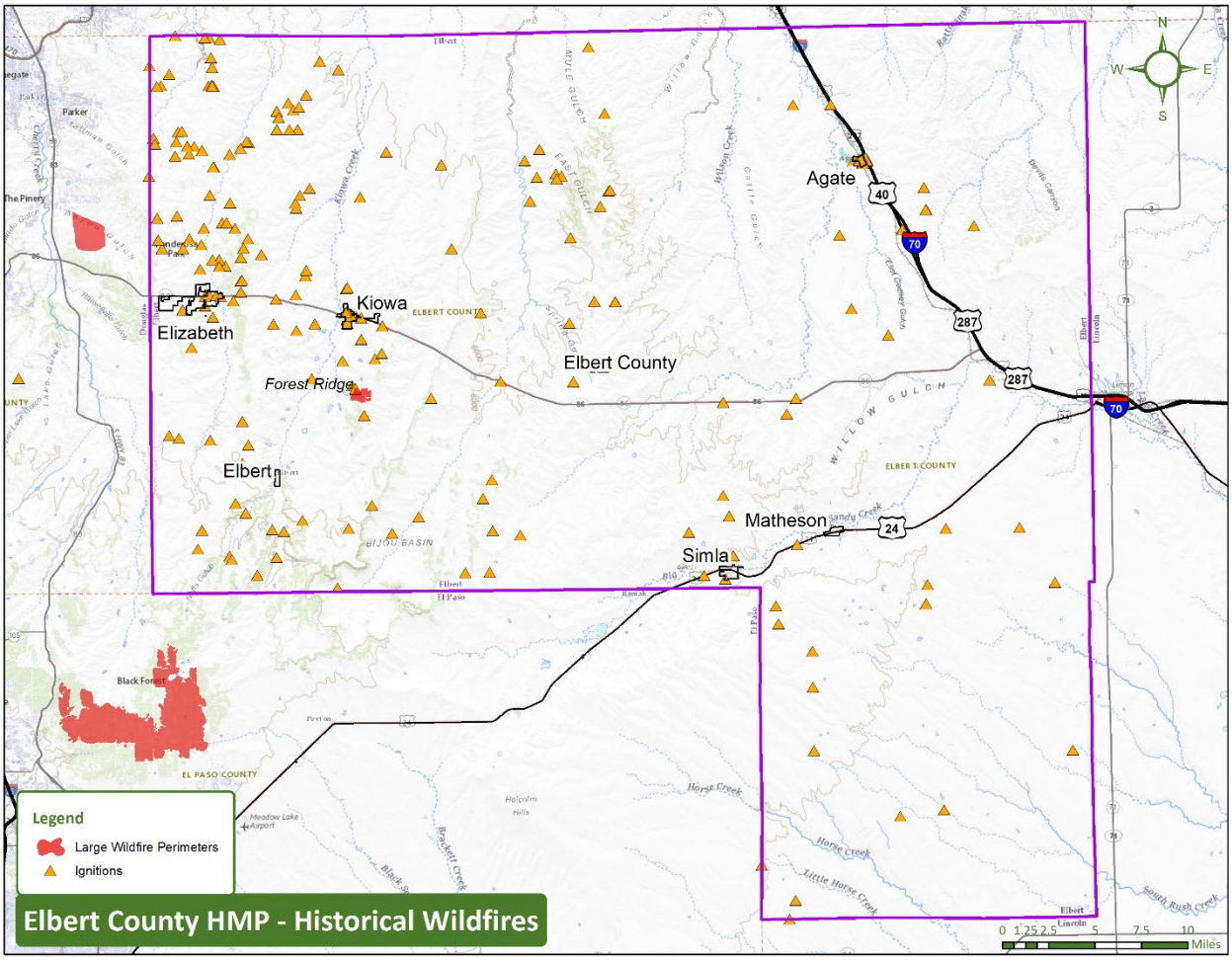
Wildfires are of significant concern throughout Colorado. According to the Colorado State Forest Service (CSFS), vegetation fires occur on an annual basis; most are controlled and contained early with limited damage. For those ignitions that are not readily contained and become wildfires, damage can be extensive. Per the 2018 Colorado State Hazard Mitigation Plan, a century of aggressive fire suppression combined with cycles of drought and changing land management practices has left many of Colorado's forests, including those in Elbert County, unnaturally dense and ready to burn. Further, the threat of wildfire and potential losses is constantly increasing as population and development grow and the WUI expands. Another contributing factor to fuel loads in the forest are standing trees killed by several species of beetles which have been affecting the forests of Colorado since 2002, becoming more widespread and a serious concern.

Fire protection in Elbert County is coordinated between the Agate, Elbert, Elizabeth, Kiowa, North Central, and Rattlesnake Fire Protection Districts, the Simla Volunteer Fire Department, the Bureau of Land Management, CSFS, and the US Forest Service. One community, Gambel Oaks, has a wildfire protection plan which was created in 2019 and can be found at the following link: Gambel Oaks Forest Protection Plan.

Past Events

The largest fire on record in Elbert County occurred in 2004 and was a grass fire that burned 1,000 acres. Figure 4.22 shows historical wildfires in the county, as well as neighboring counties, and the perimeters of large wildfires (unfortunately the 2004 fire's perimeter data was unavailable and is not mapped).

Figure 4.22 Elbert County Historical Wildfires



The county is fortunate to have a minimal history of small perimeter fires, shown in Table 4.29.

Table 4.29 Wildfire Events in Elbert County

Date	Location	Description	Acres
June 2002	Chaparral Subdivision	Burned two outbuildings	64 acres
November – December 2004	Kiowa Fire District	Grass fire	1,000 acres
July 20, 2005	EC/CR122 N SR86, Kiowa	Cowboy Camp fire, Colorado State Forest Service did three slurry dumps. More than 80 firefighters, two single-engine air tankers and 30 engines responded.	800 acres

March 22, 2006	MM324 and Hwy 24	Near Matheson	**Unknown**
March 21, 2008	Northeast of Kiowa	Magic Dog Ranch wildfire threatened eight structures. The fire started north of Highway 86. Around 150 firefighters and support staff responded. Fire was believed to be started due to an electric fence.	500 acres
May-June 2008	Countywide	Multiple wildfires across County. No injuries or damage to structures.	
June 2012	Elbert	County Road 102 fire resulted in evacuation of Town of Elbert. No damage to structures.	600 acres
August 15, 2016	County Rd 162 Agate	Basin fire, responding fire agencies: Agate, Elbert, Simla, Limon, Rattle Snake, Elizabeth, Deer Trail, North Central, Bennett and Byers. Initially reported as 2,000 acres burned, Sheriff later corrected number of acres.	667 acres
October 10, 2016	East Gulch Bijou	Bradberry fire	100-300 acres
March 4, 2018	Kiowa	Forest Ridge fire. Five homes and four barns burned, when high winds drove a fire over the dry grass.	353 acres
June 15, 2022	Elbert	A brush fire forced the evacuation of 200 people at the JCC Ranch, who were moved to Elbert High School. Roads were closed for approximately 4 hours.	

Source: Elbert County Hazard Mitigation Planning Committee, Historic Fires Database

Location

Wildfires can affect communities across the county; however, the risk of wildfire is significantly higher for those who reside in the Wildland Urban Interface (WUI). See Figure 4.24 for the highest risk WUI areas across the county.

Frequency

Data on fire occurrence for Elbert County is sparse which creates difficulties when assessing frequency. Based on the best available records, fires occur approximately every 2 years and have been close to 500 acres on average.

Severity

Wildfire is indiscriminate in the areas it can spread and therefore almost all areas in the county are at risk of the hazard. Figure 4.23 shows the overall wildfire risk across the county and Figure 4.24 shows

areas of highest wildland urban interface (WUI) risk. Readers are directed to the Colorado Forest Atlas Wildfire Risk Viewer to learn more and access a web viewer of these various risk maps.

The exposure analysis of structures and Lifelines at risk were assessed utilizing the highest (top 33%) wildfire risk areas within the county. This is to get a more practical picture of what structures and Lifelines are at the highest risk. The same is true for the Wildland Urban Interface analysis, where the highest risk analysis includes the top 33% of high WUI risk areas.

Figure 4.23 Elbert County Wildfire Risk

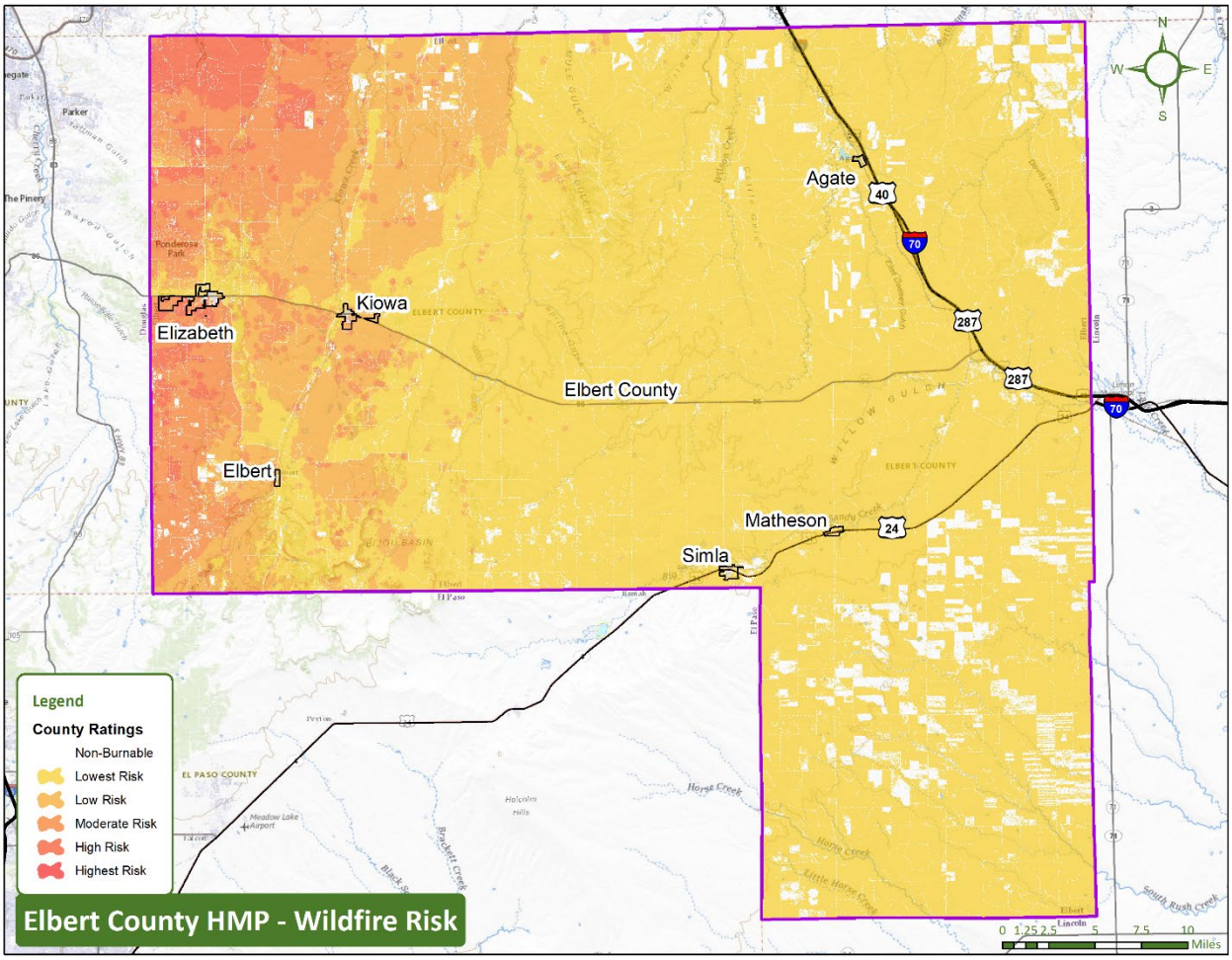
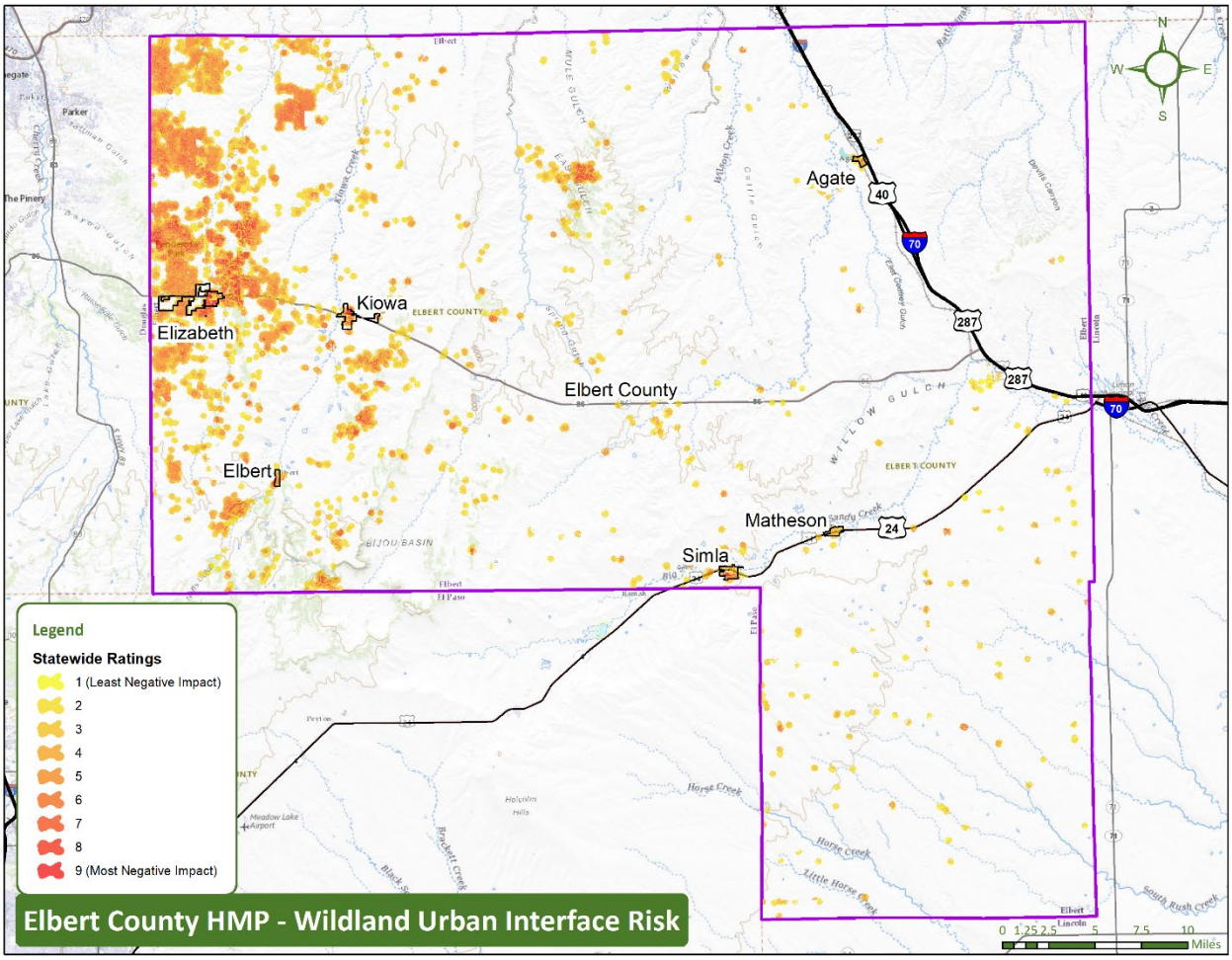


Figure 4.24 Elbert County Wildland Urban Interface Risk



Warning Time

Wildfires are often caused by humans, either intentionally or accidentally. There is no way to predict when one might break out. Because fireworks often cause brush fires, extra diligence is warranted around the Fourth of July when the use of fireworks is highest. Dry seasons and droughts are factors that greatly increase fire likelihood. Dry lightning may trigger wildfires. Severe weather can be predicted, so special attention can be paid during weather events that may include lightning. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours before a significant electrical storm.

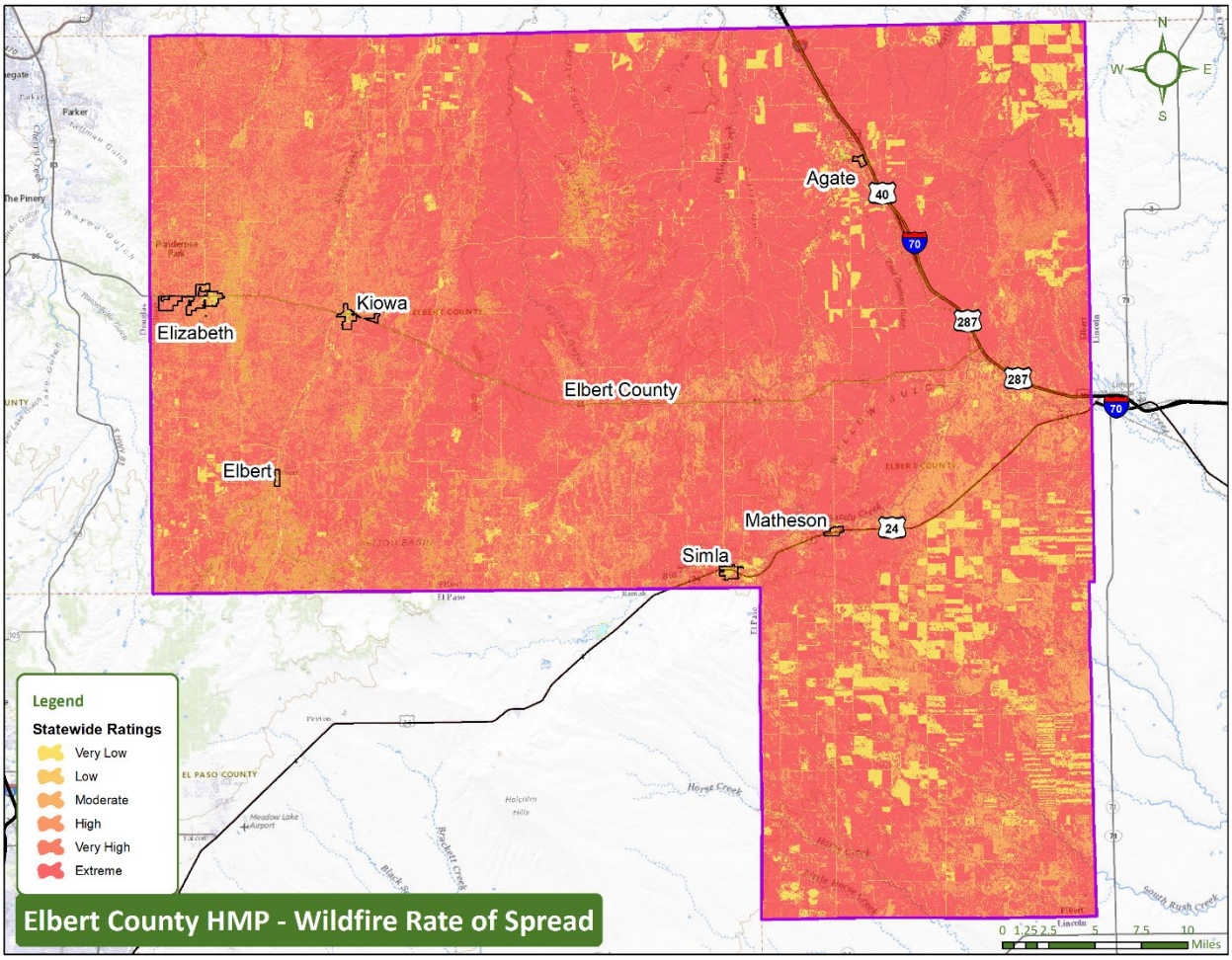
If a fire does break out and spreads rapidly, residents may need to evacuate within hours or minutes. A fire's peak burning period generally is between 1 p.m. and 6 p.m. Once a fire has started, fire alerting is reasonably rapid in most cases. Improvements to communication technologies has further contributed to a significant improvement in warning time.

Fuels, weather, and topography all contribute to fire spread rate. When considering fuels, there are multiple factors including type, especially dry and small vegetation, the quantity, and spacing of fuels (both horizontal and vertical). Weather influences spread based on wind and moisture. Topography includes slope, aspect, and terrain that each impact rate of spread in a variety of ways. Topography can increase the rate of spread up steep slopes, the amount of sunlight a fire gains heat from, and influence

the behavior of winds. Topography can also affect responder's ability to access certain areas and suppress fire activity.

Figure 4.25 shows the modeled wildfire rate of spread, with a majority of the county located in the very high and extreme categories. All municipalities are either in or near high to extreme rate of spread areas.

Figure 4.25 Elbert County Wildfire Rate of Spread



Secondary Hazards

Wildfires can generate a range of secondary effects which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines, and contribute to flooding.

Most damaging, wildfires strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause failures on slopes. Major landslides can occur several years after a wildfire. Most wildfires burn hot and for long durations which can bake soils, especially those high in clay content. This increases the imperviousness of the ground which increases the runoff generated by storm events, thus increasing the chance of flooding and debris flow events.

Exposure and Vulnerability

Lifelines

The Transportation Lifeline, most roads and railroads, would be without damage except in the worst scenarios. Energy and Communications Lifelines may be impacted as power lines are the most at risk to wildfire, since most power poles are made of wood and susceptible to burning. In the event of a wildfire, the Energy Lifeline and public safety could be at risk if fuel pipelines lead to a catastrophic explosion. Structural Lifelines of wood frame construction are especially vulnerable during wildfire events.

Fires can create conditions that block or prevent ingress / egress and can isolate residents and emergency service providers.

There are multiple Lifelines with exposure to areas with the highest wildfire or WUI risk. There are two Tier II Hazardous Materials Facilities exposed to areas with the highest WUI risk; however, no exposure to highest risk of wildfire.

The only Lifelines in Elbert County exposed to the highest risk of wildfire are located in Elizabeth, shown in Table 4.30. The Safety & Security Lifeline has no exposure.

Table 4.30 Town of Elizabeth Lifelines Exposure to Areas at the Highest Risk of Wildfire

Town of Elizabeth Lifelines	Total Count	Count Exposed	% Exposed to Risk
Food, Water, & Shelter	9	3	33%
Health & Medical	2	1	50%

Table 4.31 through Table 4.34 show the Lifeline and Tier II Facility exposure to the areas with highest WUI risk by community. The countywide exposure is 46% of the Safety & Security Lifeline, with the highest percentages in Elbert and Agate. Elizabeth and Kiowa have similar exposure.

Table 4.31 Safety & Security Lifeline Exposure to Areas with the Highest Wildland Urban Interface (WUI) Risk

Safety & Security	Total Count	Count Exposed	% Exposed to Risk
Agate	2	1	50%
Elbert	2	2	100%
Elizabeth	11	4	36%
Kiowa	9	4	44%
County Total	**33**	**11**	**33%**

The Food, Water, & Shelter Lifeline in Elbert County is 43% exposed to the areas with the highest WUI risk. This is based on the individual counts and exposures shown in Table 4.32, where both Kiowa and Parker have 100% exposure, followed closely by Simla with 75%, and finished by Elizabeth with 33% exposed. Kiowa and Simla have similar counts and the high exposure should be considered during future planning.

Table 4.32 Food, Water, & Shelter Lifeline Exposure to Areas with the Highest Wildland Urban Interface (WUI) Risk

Food, Water, & Shelter	Total Count	Count Exposed	% Exposed to Risk
Elizabeth	9	3	33%
Kiowa	5	5	100%
Parker	1	1	100%
Simla	4	3	75%
County Total	**28**	**12**	**43%**

In Elbert County, the only Health & Medical Lifeline exposure to areas with the Highest WUI risk is in Elizabeth with 50% exposed. The total count in the county for Health & Medical Lifeline is four, with two in Elizabeth and one each in Simla and Kiowa.

Table 4.33 Health & Medical Lifeline Exposure to Areas with the Highest Wildland Urban Interface (WUI) Risk

Health & Medical	Total Count	Count Exposed	% Exposed to Risk
Elizabeth	2	1	50%
County Total	**4**	**1**	**25%**

Of the 17 facilities in Elbert County, only two are exposed to areas with the highest WUI risk. Of these facilities, the majority are located in Kiowa, and the rest are spread across the county.

Table 4.34 Tier II Hazardous Materials Facility Exposure to Areas with the Highest Wildland Urban Interface (WUI) Risk

Tier II Hazardous Materials Facilities	Total Count	Count Exposed	% Exposed to Risk
Elbert	2	2	100%
County Total	**17**	**2**	**12%**

People

Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility.

Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and the after-effects from smoke inhalation and heat stroke.

A report titled: *'Ahead of the Fire: Where will the West's next deadly wildfire strike? The risks are everywhere.'"*[5] was published in The Arizona Republic in the summer of 2019. The study, spurred by the devastating Paradise Fire in California, looked across 5,000 small communities throughout 11 states to determine wildfire risk.

The analysis began with the U.S. Forest Service's Wildfire Hazard Potential (WHP) which assigns a score to every 18-acre parcel of land in the country. The higher the score, the higher the probability the place will experience a catastrophic wildfire.

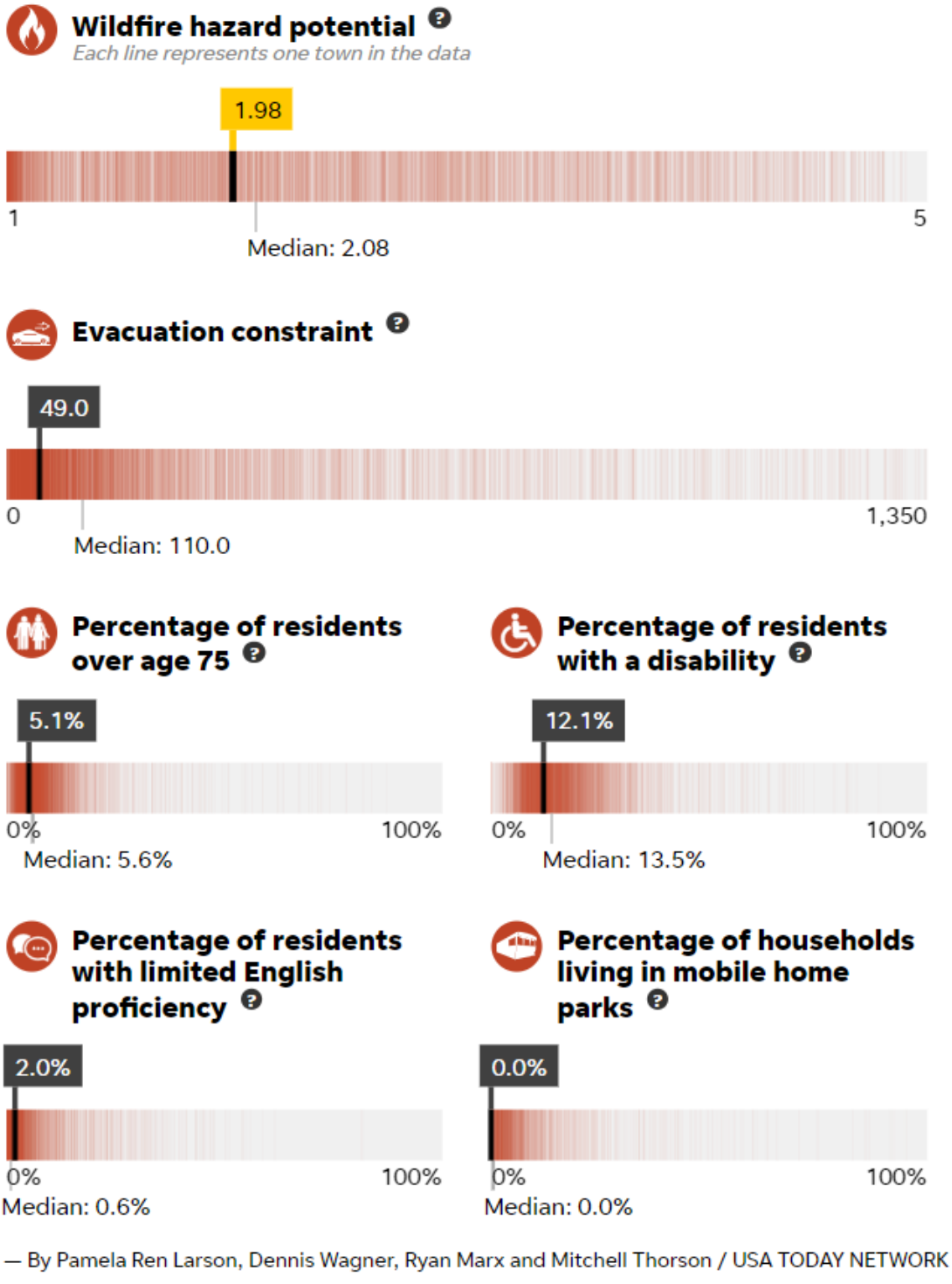
Elizabeth, Kiowa, and Simla each have results from the analysis which are shown in Figure 4.26 through Figure 4.28. Inputs into this analysis included a wildfire hazard potential dataset, in addition to the following inputs: evacuation routes, resident age, disabilities, and language spoken, emergency alerts, and mobile home inventories. Note that the demographic data utilized aligns with access and functional needs (AFN) categories.

Elizabeth has a score approximately double the wildfire hazard potential as both Kiowa and Simla. However, Elizabeth has the lowest evacuation constraint score. Per the Arizona Republic report, evacuation constraint refers to how "limited routes out of a community can lead to mass congestion during evacuation. Evacuation constraint is measured as the ratio of total households (including seasonal residences) to major roads that exit a community."

While Kiowa and Simla have similar demographics to Elizabeth, the vegetation, slope, and other environmental factors also impact the ultimate score, as well as other considerations such as emergency alerts.

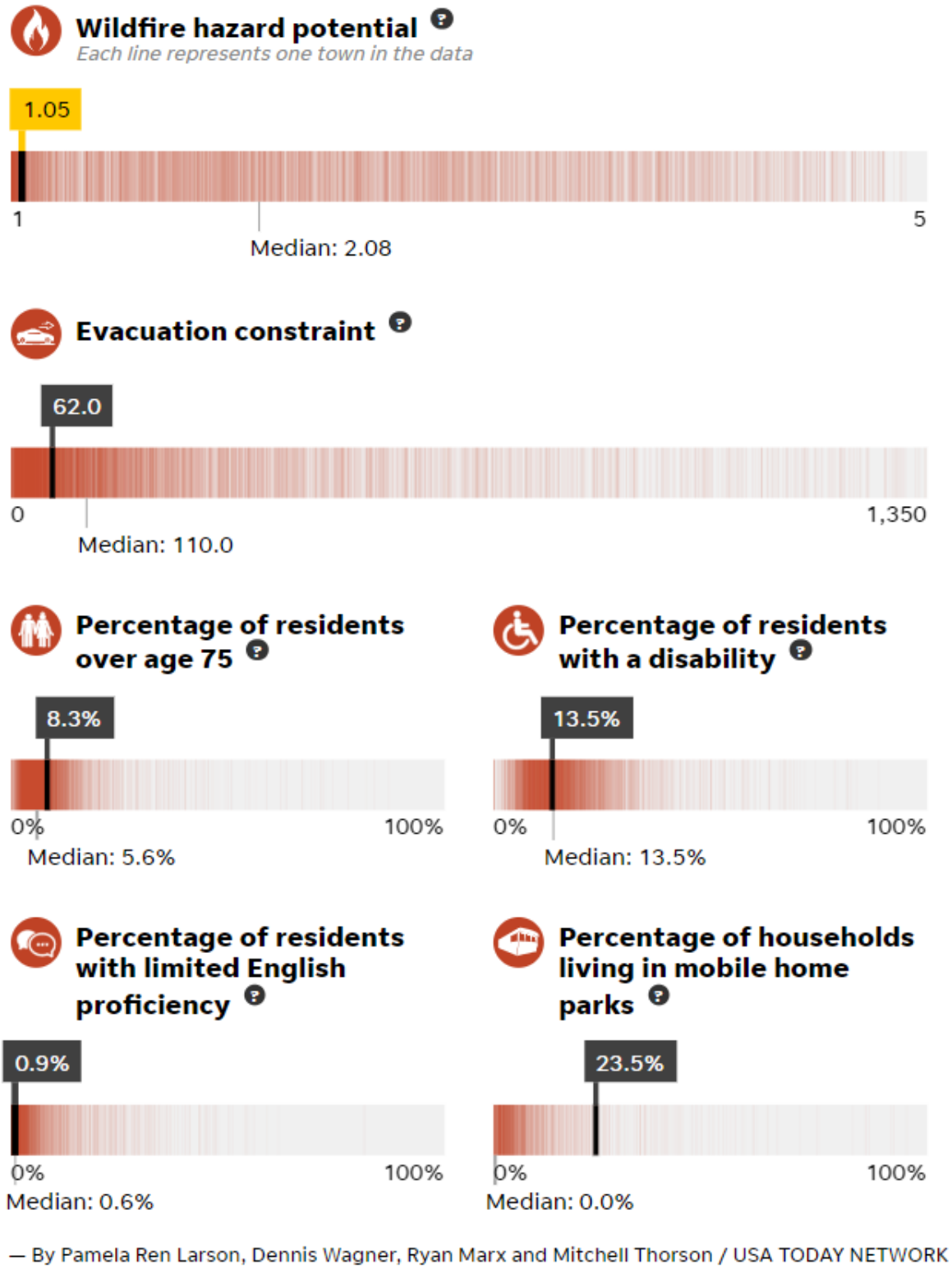
[5] Ahead of the Fire: Where will the West's next deadly wildfire strike?

Figure 4.26 Town of Elizabeth "Ahead of the Fire" Report



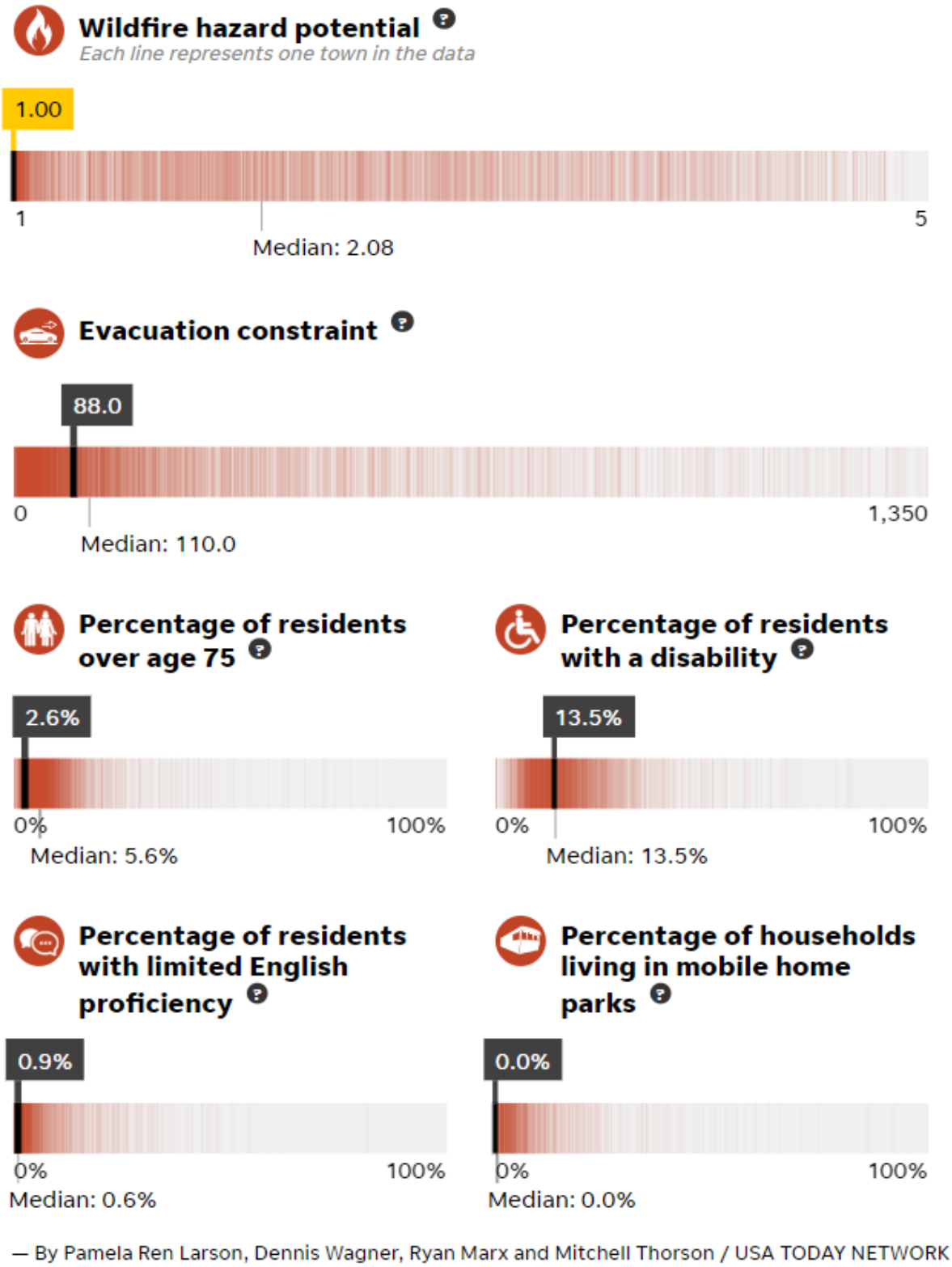
— By Pamela Ren Larson, Dennis Wagner, Ryan Marx and Mitchell Thorson / USA TODAY NETWORK

Figure 4.27 Town of Kiowa "Ahead of the Fire" Report



— By Pamela Ren Larson, Dennis Wagner, Ryan Marx and Mitchell Thorson / USA TODAY NETWORK

Figure 4.28 Town of Simla "Ahead of the Fire" Report



— By Pamela Ren Larson, Dennis Wagner, Ryan Marx and Mitchell Thorson / USA TODAY NETWORK

Environment

Fire is a natural and critical ecosystem process in most terrestrial ecosystems, dictating in part the types, structure, and spatial extent of native vegetation. However, wildfires can cause severe environmental impacts:

- Damaged Fisheries – Critical fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- Soil Erosion – The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion can occur, causing landslides and threatening aquatic habitats.
- Spread of Invasive Plant Species – Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes, and become difficult and costly to control.
- Disease and Insect Infestations – Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- Destroyed Endangered Species Habitat – Catastrophic fires can have devastating consequences for endangered species.
- Soil Sterilization – Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. It can take decades or even centuries for ecosystems to recover from a fire. Some fires burn so hot they can sterilize the soil.

Many ecosystems are adapted to historical patterns of fire occurrence. These patterns, called "fire regimes," include temporal attributes (e.g., frequency and seasonality), spatial attributes (e.g., size and spatial complexity), and magnitude attributes (e.g., intensity and severity), each of which have ranges of natural variability. Ecosystem stability is threatened when any of the attributes for a given fire regime diverge from its range of natural variability.

Property

Property damage from wildfires can be severe and can significantly alter entire communities. Based on an evaluation of best available structure footprint data for the county, there are 2,427 buildings across the county identified as being within the county's highest (top 33%) wildfire risk areas. A similar analysis of WUI risk areas show that 2,701 buildings are located in the county's (and state's) highest (top 33%) WUI risk areas. Table 4.35 and Table 4.36 show the locations and types of these structures.

While this analysis attempts to quantify those structures at most risk across the county, it should be noted that all property is potentially vulnerable to wildfire.

Table 4.35 Building Footprint Exposure to Areas at the Highest Risk of Wildfire

	Residential	Commercial	Industrial	Agricultural	Exempt
Elbert	68	3		29	
Elizabeth	1,976	13	5	301	15
Kiowa	12			4	
TOTAL	**2,057**	**16**	**5**	**334**	**15**

Table 4.36 Building Footprint Exposure to Areas with the Highest Wildland Urban Interface (WUI) Risk

	Residential	Commercial	Industrial	Agricultural	Exempt
Agate	6	1		1	2
Elbert	72	10		3	8
Elizabeth	2,031	17	2	32	38
Kiowa	300	11		15	22
Matheson	4			7	
Simla	101	4		5	7
TOTAL	**2,514**	**43**	**2**	**64**	**78**

Data from the Elbert County assessor was utilized to show the type and value of parcels exposed to the areas with the highest wildfire and WUI. Parcel level data may contain multiple structures, but it is possible only one structures is exposed to the hazard area. Hazard layers are not exact and therefore it can be difficult to determine exposure and value at a building footprint level. Parcel level data allows an overview of the value of parcels with exposure to the hazard layer.

The values in Table 4.37 and Table 4.38 are listed as the total actual values of parcels per the county assessor data.

The residential parcels in the highest wildfire risk areas have a value of over $720 million and 96% of these parcels are located in Elizabeth. Agricultural parcels have the next highest value at approximately $72 million, followed by exempt parcels at over $12 million in value and commercial parcel value of over $10 million. Elizabeth is the only location with exposed industrial parcels which are valued at approximately $760,000.

Table 4.37 Value of Parcels Exposed to Areas at the Highest Risk of Wildfire

	Residential	Commercial	Industrial	Agricultural	Exempt
Elbert	$25,740,000	$180,700		$3,580,000	
Elizabeth	$690,280,000	$9,900,000	$760,630	$67,880,000	$12,050,000
Kiowa	$4,735,000			$714,000	
TOTAL	**$720,755,000**	**$10,080,700**	**$760,630**	**$72,174,000**	**$12,050,000**

The residential parcels in the highest WUI risk areas have a value of over $844 million. Exempt parcels have the next highest value at approximately $25.6 million, followed by agricultural parcels at over $13.6 million in value. Commercial parcel value is approximately $9 million in the county and the only industrial parcels exposed are located in Elizabeth with a value of $341,000.

Elizabeth holds the highest parcel values across all types, equating to approximately 86% of the total value of exposed parcels in the county. Kiowa carries the next highest with roughly 10% of the total parcel value exposed.

Table 4.38 Value of Parcels Exposed to Areas with the Highest Wildland Urban Interface (WUI) Risk

	Residential	Commercial	Industrial	Agricultural	Exempt
Agate	$214,000	$3,300		$25,000	$183,000
Elbert	$15,000,000	$1,600,000		$996,000	$1,524,000
Elizabeth	$742,000,000	$6,000,000	$341,000	$8,150,000	$15,360,000
Kiowa	$76,400,000	$1,100,000		$3,500,000	$8,120,000
Matheson	$243,600			$537,000	
Simla	$10,400,00	$282,000		$417,000	$435,500
TOTAL	**$844,257,600**	**$8,985,300**	**$341,000**	**$13,625,000**	**$25,622,500**

Economy

Wildfire can impact the economy due to potential damage to property, crops, and livestock. There may be direct costs due to losses and indirect costs for the loss of work that comes from harvest and livestock transport. Overhead that may result during repair or reconstruction of properties may also be an indirect cost.

If roads are closed or areas are evacuated due to a fire, transport may be limited, and businesses may have to close. While this can typically be a short-term impact, prolonged wildfires can have a large impact on the operations of a community and its economy.

Future Trends in Development

Future population change across the county is expected to be 2.7% annually over the next decade. This is a considerable increase from the annual growth experienced over the last five years (1.7%). As some of these areas are at a higher risk to wildfire and located in the WUI, future development has the potential to greatly increase the risk to this hazard.

While the risk of wildfire on public land is generally understood, much of the adjacent private land is equally at risk. Private lands adjoining public lands are becoming increasingly valued for their scenic beauty, solitude, and access to recreation opportunities. As development in these areas continue to increase, the risk to lives, property, and resources correspondingly increases.

The expansion of the WUI can be managed with strong land use and building codes. In May 1972, a revision to the Colorado Revised Statutes exempted properties divided into parcels of 35 acres or more from the statutory definition of a subdivision. Tracts of 35-acre lots developed since that time have not been subject to state or local subdivision regulations.

The county and both towns have adopted the 2018 International Building Code (IBC), and Simla has previously adopted building codes. This is crucial to public safety as growth continues and development increases. Adherence to these existing building codes and including adoption of more recent codes by Simla will ensure construction is more likely to withstand a wildfire event.

Probability of Future Occurrences

Considering the minimal history of fire in the county, it would seem probability is low. However, as was seen by the recent 2021 Marshall Wildfire in Boulder County, wildland fires are capable of catastrophic damage in areas typically considered low risk.

With the increasing population in Elbert County, the wildfire and WUI risk areas are expected to see more construction and structures. More development in these areas poses new considerations for probability, as humans are the most significant cause of wildfire.

Climate change impacts will likely have an unpredictable impact on wildfire occurrences in the county.

Climate Change Impacts

Fire in western ecosystems is affected by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

According to the 2018 State of Colorado Hazard Mitigation Plan, “statewide annual average temperatures have increased by 2.0°F over the past 30 years and 2.5°F over the past 50 years. Warming trends have been observed over these periods in most parts of the state.”

Such conditions can exacerbate drought, further promoting wildfires which then release stores of carbon and further contribute to the buildup of greenhouse gases.

5 FIRE PROTECTION DISTRICTS

Figure 3.1 Elbert County Overview shows all local fire protection districts across Elbert County. The following contributed to the content included in this HMP:

- Elizabeth Fire Protection District
- Kiowa Fire Protection District
- Rattlesnake Fire Protection District
- Simla (Big Sandy) Fire Protection District
- North Central Fire Protection District
- Agate Fire Protection District

5.1 FPD Capabilities

Fire protection districts have a wide range of capabilities depending on a multitude of factors such as funding, personnel availability, and community need. A summary of these capabilities are presented in the following tables.

Table 5.1 Personnel Availability

Personnel	Full Time	Part Time	Volunteer
Elizabeth FPD	26	10	11
North Central FPD			9
Kiowa FPD	4	2	19
Big Sandy FPD	1	1	12
Agate FPD			15
Rattlesnake FPD	14	8	32

Facilities – Elizabeth FPD operates out of four facilities with a personnel capacity of 12 and North Central FPD operates out of one facility. Kiowa FPD utilizes three facilities for operations, while Big Sandy FPD is based at one facility. Agate FPD uses two facilities with a personnel capacity of 15 and Rattlesnake FPD utilizes five facilities.

These facilities are included in the countywide risk assessment of the Safety & Security Lifeline. The hazard exposure analysis overview in this plan does not detail specific Lifeline subcomponent exposure. However, communities and fire protection districts use the comprehensive analysis data of subcomponent exposure at the local level to identify mitigation goals and community priorities.

Table 5.2 Training Capacity

Training	FF-1	FF-2	EMT-1	EMT Paramedic	Wildland Fire (S-130/190)
Elizabeth FPD	46	9	44	13	44
North Central FPD			3		8
Kiowa FPD	13	6	16	8	25
Big Sandy FPD	1		3		2
Agate FPD	3	2	3	3	3
Rattlesnake FPD	33	8	29	7	31

Table 5.3 Mutual Aid Agreements

Elizabeth FPD Mutual Aid Agreements	North Central FPD Mutual Aid Agreements	Kiowa FPD Mutual Aid Agreements	Big Sandy FPD Mutual Aid Agreements	Agate FPD Mutual Aid Agreements	Rattlesnake FPD Mutual Aid Agreements
Agate Fire	Agate Fire	Agate Fire	Elbert Fire	Deer Trail Fire	All Elbert County
Big Sandy Fire	Byers Fire	Big Sandy Fire	Elizabeth Fire	Elbert Fire	All Douglas County
Elbert Fire	Elbert Fire	Elbert Fire	Kiowa Fire	Elizabeth Fire	All Arapahoe County
Franktown Fire	Kiowa Fire	Elizabeth Fire	North Central Fire	Hugo Fire	
Kiowa Fire	Rattlesnake Fire	Franktown Fire	Rattlesnake Fire	Kiowa Fire	
Rattlesnake Fire		North Central Fire	Calhan Fire	Limon Fire	
South Metro Fire		Rattlesnake Fire	Tri-County Fire	North Central Fire	
			Limon Fire	Rattlesnake Fire	
				Simla Fire	

Table 5.4 Engine Type and Availability

Apparatus - Engines	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Pump and Roll	Foam Capabilities	All-Terrain Vehicle (ATV)
Elizabeth FPD	3					3		3	3	
North Central FPD	1				1	1		1	2	1
Kiowa FPD	2					3			3	1
Big Sandy FPD	1		1		3			2	1	
Agate FPD	2			2		1		3	5	
Rattlesnake FPD	5	2				5	5	Yes	Yes	

Table 5.5 Water Tender Availability

Apparatus – Water Tenders (gallons)	S-1	S-2	S-3	T-1	T-2
Elizabeth FPD	4,000	2,100	3,000		
North Central FPD				3,000	1,800
Kiowa FPD	3,400				
Big Sandy FPD	4,000			2,000	
Agate FPD	4,000	2,000			
Rattlesnake FPD				3,000	3,000

Table 5.6 SCBAs and Communications

Apparatus – SCBAs / Communications	Elizabeth FPD	North Central FPD	Kiowa FPD	Big Sandy FPD	Agate FPD	Rattlesnake FPD
Breathing Apparatus (SCBAs)	40 - all >5 years in use	6 - all >5 years in use	20 - all >5 years in use	12 - all >5 years in use	15 - all >5 years in use	48
Radios – Mobile Units	23	6	15	12	21	35
Radios – Handheld Units	54	12	25	24	40	

Table 5.7 Reliable Waterworks and Water Storage

Reliable Waterworks and Water Storage	Elizabeth FPD	North Central FPD	Kiowa FPD	Big Sandy FPD	Agate FPD	Rattlesnake FPD
Flow Rate Range	1000gpm-2500gpm			100-1000gpm	100-1000gpm	
Mapped Hydrants	Yes		52	Yes	Yes	Yes
Hydrants Tested Annually	Yes			None	No	Yes
Water Storage Tanks – 12,000 gallons	3			1		
Water Storage Tanks – 15,000 gallons	1					
Water Storage Tanks – 16,000 gallons	2					
Water Storage Tanks – 20,000 gallons	4					
Water Storage Tanks – 30,000 gallons	9	1		1		
Water Storage Tanks – 35,000 gallons						2
Water Storage Tanks – 60,000 gallons						2

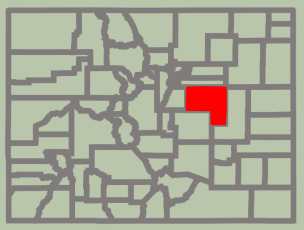
Reliable Waterworks and Water Storage	Elizabeth FPD	North Central FPD	Kiowa FPD	Big Sandy FPD	Agate FPD	Rattlesnake FPD
Water Storage Tanks – 70,000 gallons					1	
Water Storage Tanks – 100,000 gallons			1			
Water Storage Tanks – 350,000 gallons				1		
Water Storage Tanks – 1,000,000 gallons			1			

6 WILDFIRE RISK ASSESSMENT SUMMARY REPORT

2022 Colorado Wildfire Risk Assessment Summary Report

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

ElbertHMP



Report was generated using

www.ColoradoForestAtlas.org

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User should also note that property boundaries included in any product do not represent an on-the-ground survey suitable for legal, engineering, or surveying purposes. They represent only the approximate relative locations.

Introduction

Colorado Wildfire Risk Assessment Report

Welcome to the Colorado Wildfire Risk Assessment Summary Reporting Tool.

This tool allows users of the Risk Reduction Planner application of the Colorado Forest Atlas web portal to define a specific project area and generate information for this area. A detailed risk summary report can be generated using a set of predefined map products developed by the Colorado Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. The report is generated in PDF format.

The report has been designed so that information from the report can be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Risk Assessments, and Forest Management or Stewardship Plans. Example templates for some of these reports are available for download on the Colorado Forest Atlas web portal.



The Colorado WRA provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in Colorado.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.

The Colorado WRA products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire
- Plan and prioritize hazardous fuel treatment programs
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries
- Increase communication with local residents and the public to address community priorities and needs

Products

Each product in this report is accompanied by a general description, table, chart and/or map. A list of available Colorado WRA products in this report is provided in the following table.

COWRA Product	Description
Wildfire Risk	The overall composite risk occurring from a wildfire derived by combining Burn Probability and Values at Risk Rating
Burn Probability	Annual probability of any location burning due to wildfire
Fire Intensity Scale	Quantifies the potential fire intensity by orders of magnitude
Wildland Urban Interface	Housing density depicting where humans and their structures meet or intermix with wildland fuel
Wildland Urban Interface Risk	Annual probability of any location burning due to wildfire
Values at Risk Rating	A composite rating of values and assets that would be adversely impacted by a wildfire by combining the four main risk outputs
Suppression Difficulty Rating	Reflects the difficulty or relative cost to suppress a fire given the terrain and vegetation conditions that may impact machine operability
Drinking Water Risk Index	A measure of the risk to Drinking Water Risk Index Areas (DWIA) based on the potential negative impacts from wildfire
Forest Assets Risk Index	A measure of the risk to forested areas based on the potential negative impacts from wildfire
Riparian Assets Risk Index	A measure of the risk to riparian areas based on the potential negative impacts from wildfire
Characteristic Flame Length	A measure of the expected flame length of a potential fire

COWRA Product	Description
Characteristic Rate of Spread	A measure of the expected rate of spread of a potential fire
Fire Type Extreme Weather	Represents the potential fire type under the extreme percentile weather category
Surface Fuels	A measure of the expected rate of spread of a potential fire
Characteristic Rate of Spread	Characterization of surface fuel models that contain the parameters for calculating fire behavior outputs
Vegetation	General vegetation and landcover types
Forest Assets	Identifies forested land categorized by susceptibility or response to fire
Riparian Assets	Forested riparian areas characterized by functions of water quantity and quality, and ecology
Drinking Water Importance Areas	A measure of quality and quantity of public surface drinking water categorized by watershed

Wildland Urban Interface

Description

Colorado is one of the fastest growing states in the Nation, with much of this growth occurring outside urban boundaries. This increase in population across the state will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire.



For the **ElbertHMP** project area, it is estimated that **25,183** people or **99.8 %** percent of the total project area population (25,231) live within the WUI.

The Wildland Urban Interface (WUI) layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. In the past, conventional wildland-urban interface datasets, such as USFS SILVIS, have been used to reflect these concerns. However, USFS SILVIS and other existing data sources did not provide the level of detail needed by the Colorado State Forest Service and local fire protection agencies.

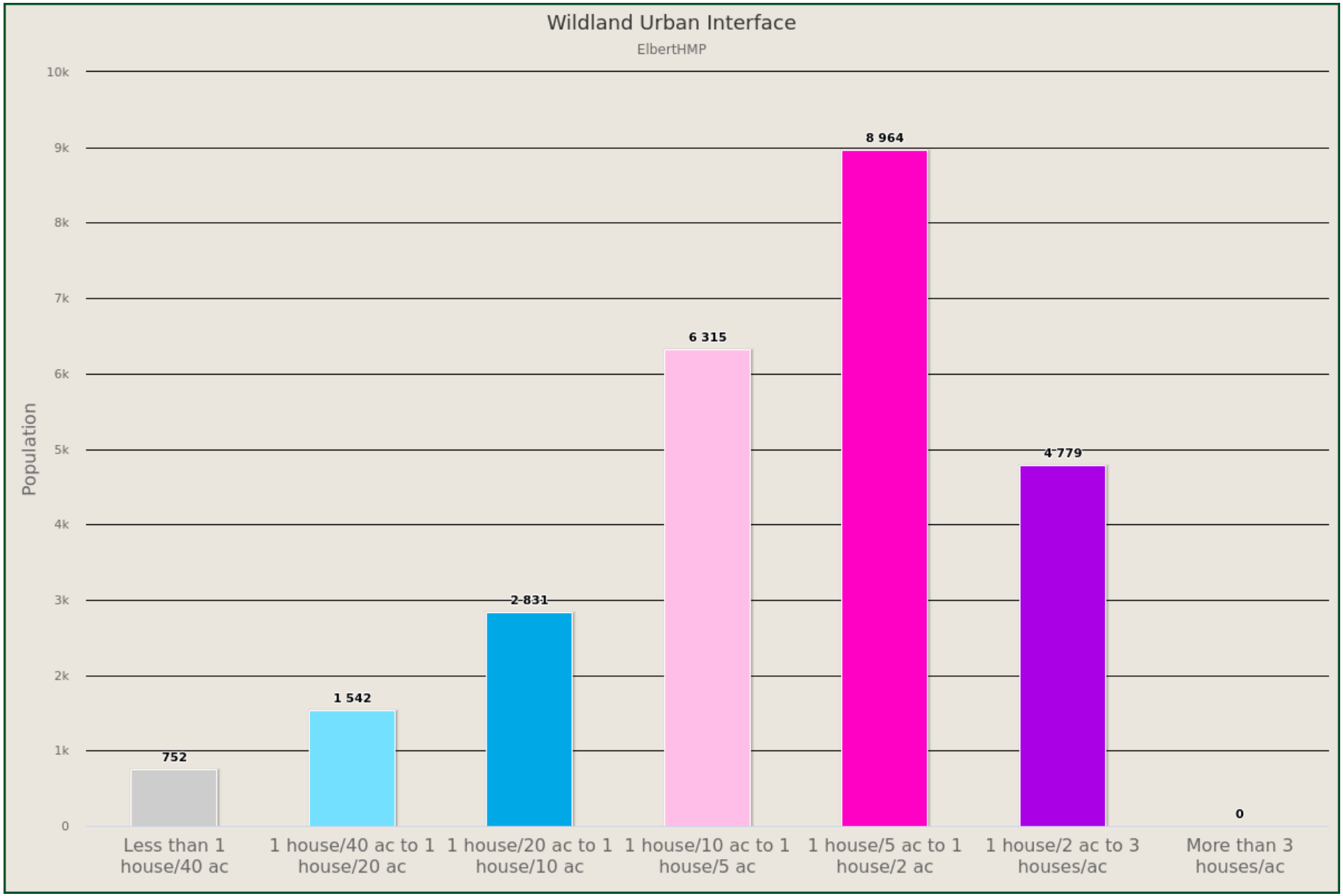
The new WUI dataset is derived using advanced modeling techniques based on the Where People Live dataset and 2016 LandScan USA population count data available from the Department of Homeland Security, HSIP dataset. WUI is simply a subset of the Where People Live dataset. The primary difference is populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live dataset, as these areas are not expected to be directly impacted by a wildfire. This accommodates WUI areas based on encroachment into urban areas where wildland fire is likely to spread.

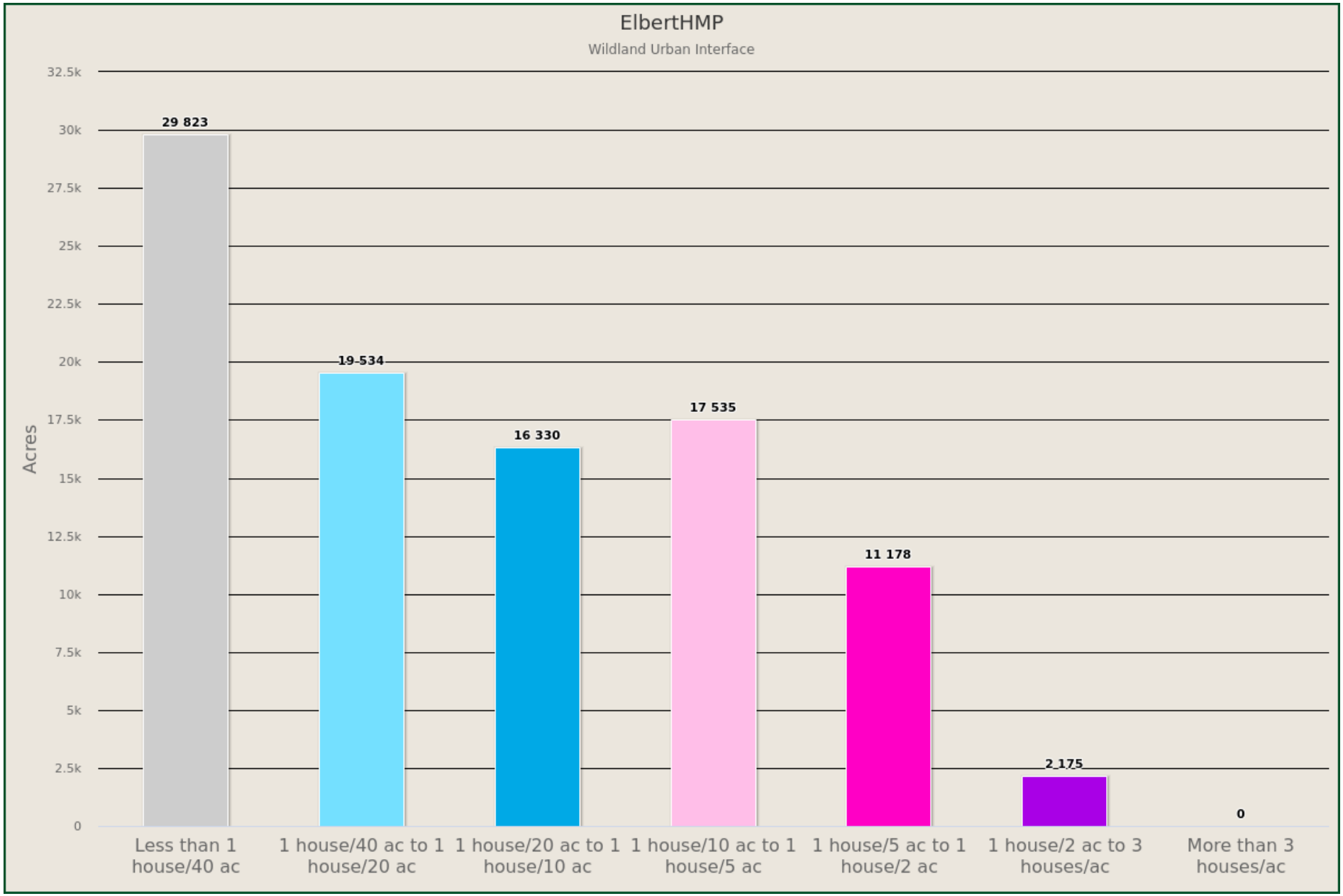


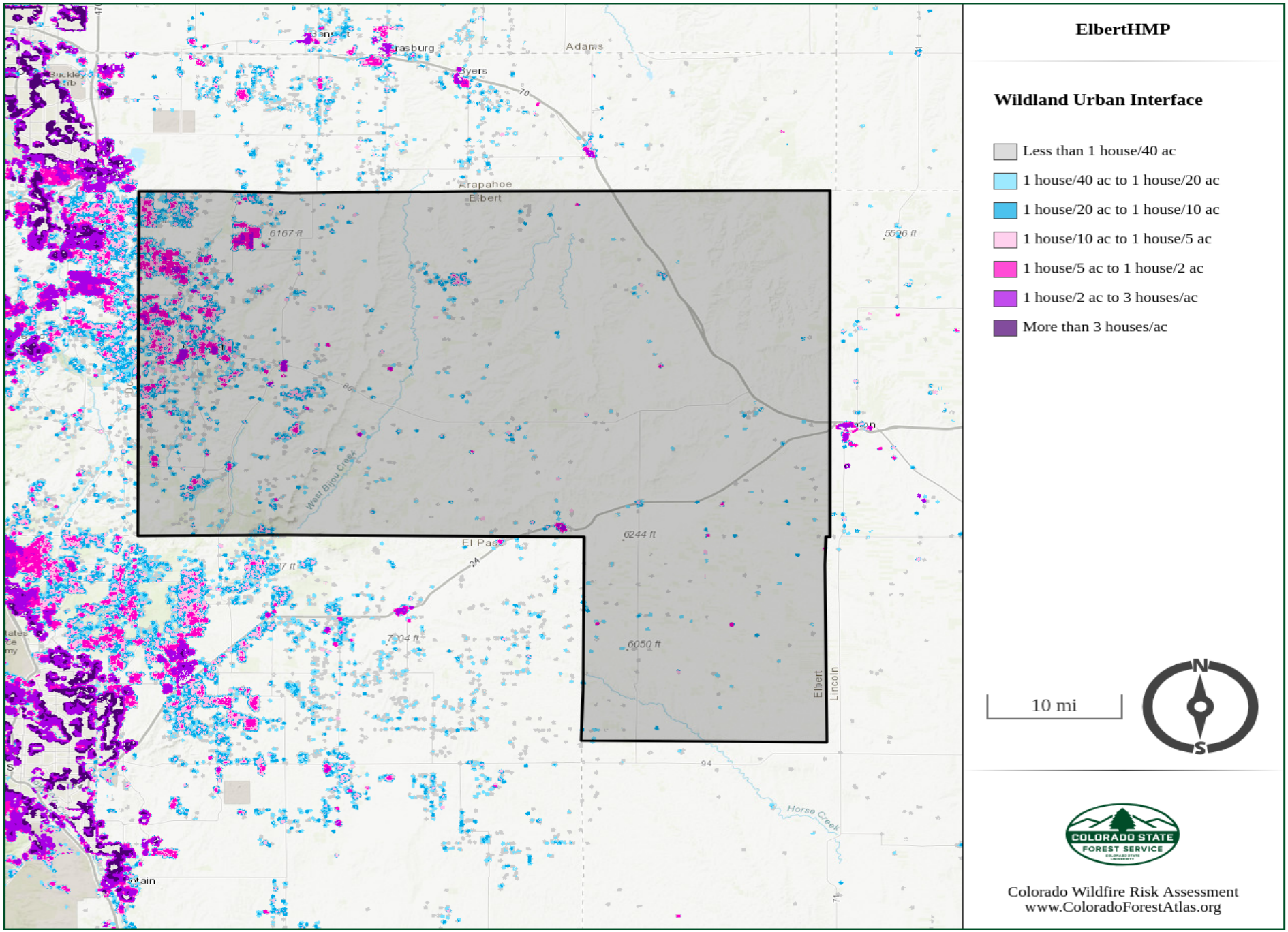
A more detailed description of the risk assessment algorithms is provided in the Colorado Wildfire Risk Assessment (Colorado WRA) Final Report, which can be downloaded from www.ColoradoForestAtlas.org.

Data are modeled at a 30-meter cell resolution (30 m2 or 900 m area per map cell), which is consistent with other Colorado WRA layers. The WUI classes are based on the number of houses per acre. Class breaks are based on densities understood and commonly used for fire protection planning.

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
Less than 1 house/40 ac	752	3.0 %	29,823	30.9 %
1 house/40 ac to 1 house/20 ac	1,542	6.1 %	19,534	20.2 %
1 house/20 ac to 1 house/10 ac	2,831	11.2 %	16,330	16.9 %
1 house/10 ac to 1 house/5 ac	6,315	25.2 %	17,535	18.2 %
1 house/5 ac to 1 house/2 ac	8,964	35.8 %	11,178	11.6 %
1 house/2 ac to 3 houses/ac	4,779	19.6 %	2,175	2.3 %
More than 3 houses/ac	0	0.0 %	0	0 %
Total	**25,183**	**100.0 %**	**96,574**	**100.0 %**


Wildland Urban Interface
ElbertHMP
Population
10k
9k
8k
7k
6k
5k
4k
3k
2k
1k
0
752
1 542
2 831
6 315
8 964
4 779
0
Less than 1 house/40 ac
1 house/40 ac to 1 house/20 ac
1 house/20 ac to 1 house/10 ac
1 house/10 ac to 1 house/5 ac
1 house/5 ac to 1 house/2 ac
1 house/2 ac to 3 houses/ac
More than 3 houses/ac


ElbertHMP
Wildland Urban Interface
Acres
32.5k
30k
27.5k
25k
22.5k
20k
17.5k
15k
12.5k
10k
7.5k
5k
2.5k
0
29 823
19 534
16 330
17 535
11 178
2 175
0
Less than 1 house/40 ac
1 house/40 ac to 1 house/20 ac
1 house/20 ac to 1 house/10 ac
1 house/10 ac to 1 house/5 ac
1 house/5 ac to 1 house/2 ac
1 house/2 ac to 3 houses/ac
More than 3 houses/ac


ElbertHMP
Wildland Urban Interface
Less than 1 house/40 ac
1 house/40 ac to 1 house/20 ac
1 house/20 ac to 1 house/10 ac
1 house/10 ac to 1 house/5 ac
1 house/5 ac to 1 house/2 ac
1 house/2 ac to 3 houses/ac
More than 3 houses/ac
10 mi
N
S
COLORADO STATE FOREST SERVICE
Colorado Wildfire Risk Assessment
www.ColoradoForestAtlas.org
Adams
Arapahoe
Elbert
El Paso
Lincoln
Byers
Strasburg
West Bijou Creek
Horse Creek
6167 ft
6244 ft
6050 ft
7004 ft

Wildland Urban Interface (WUI) Risk Index

Description

The Wildland-Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the wildland-urban interface and rural areas is essential for defining potential wildfire impacts to people and homes.

The WUI Risk Index is derived using a response function modeling approach. Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire at different intensity levels, such as flame length.

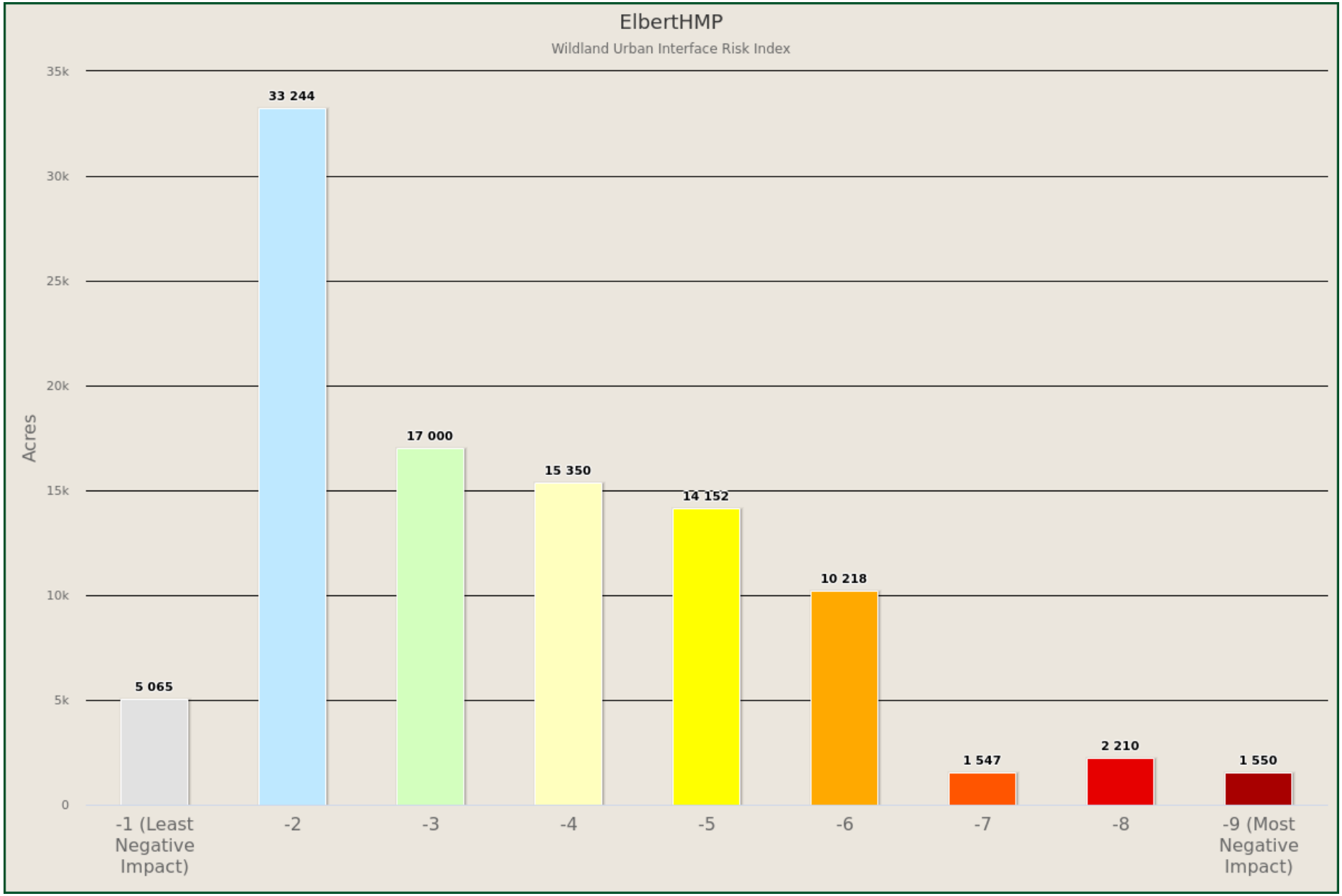
To calculate the WUI Risk Index, the WUI housing density data were combined with flame length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts led by Colorado State Forest

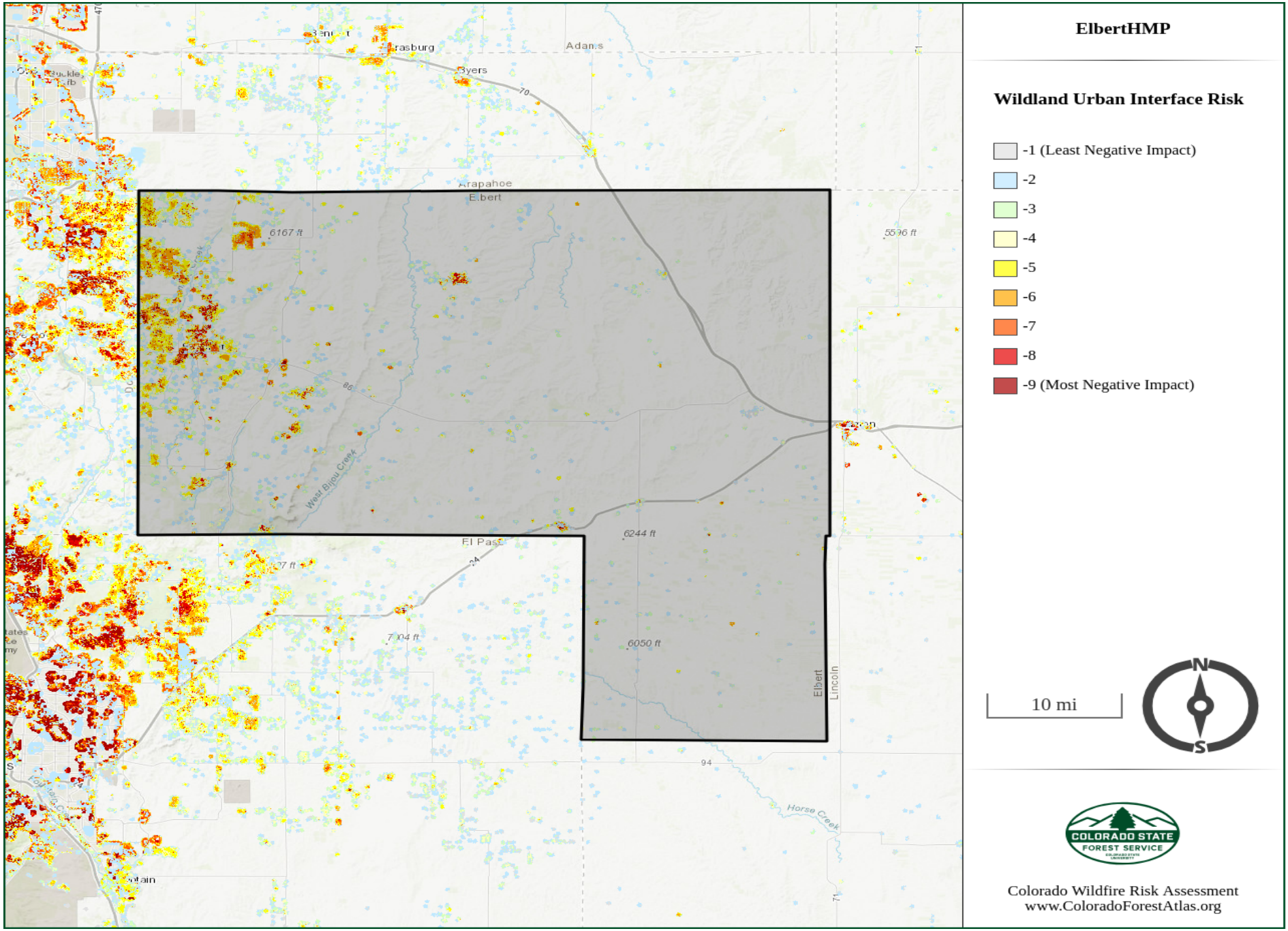
Service mitigation planning staff. By combining flame length with the WUI housing density data, it is possible to determine where the greatest potential impact to homes and people is likely to occur.

The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9, while areas with low housing density and low flame lengths are rated -1.

The WUI Risk Index has been calculated consistently for all areas in Colorado, which allows for comparison and ordination of areas across the entire state. Data are modeled at a 30-meter cell resolution, which is consistent with other Colorado WRA layers.

WUI Risk Class	Acres	Percent
-1 (Least Negative Impact)	5,065	5.0 %
-2	33,244	33.1 %
-3	17,000	16.9 %
-4	15,350	15.3 %
-5	14,152	14.1 %
-6	10,218	10.2 %
-7	1,547	1.5 %
-8	2,210	2.2 %
-9 (Most Negative Impact)	1,550	1.5 %
Total	**100,336**	**100 %**


ElbertHMP
Wildland Urban Interface Risk Index
Acres
35k
30k
25k
20k
15k
10k
5k
0
5 065
33 244
17 000
15 350
14 152
10 218
1 547
2 210
1 550
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)


ElbertHMP
Wildland Urban Interface Risk
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)
Adams
Byers
Arapahoe
Elbert
6167 ft
5596 ft
6244 ft
6050 ft
West Bijou Creek
El Paso
Elbert
Lincoln
Horse Creek
10 mi
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Firewise USA®

Description

Firewise USA® is a national recognition program that provides resources to inform communities how to adapt to living with wildfire and encourages neighbors to take action together to reduce their wildfire risk. Colorado communities that take the following five steps can be recognized as Firewise:

1. Form a Firewise board or committee
2. Obtain a wildfire risk assessment from the CSFS or local fire department, and create an action plan
3. Hold a Firewise event once per year
4. Invest a minimum of $24.14 per dwelling unit in local Firewise actions annually
5. Create a National Fire Prevention Association (NFPA) profile and follow the application directions located at https://portal.firewise.org/user/login

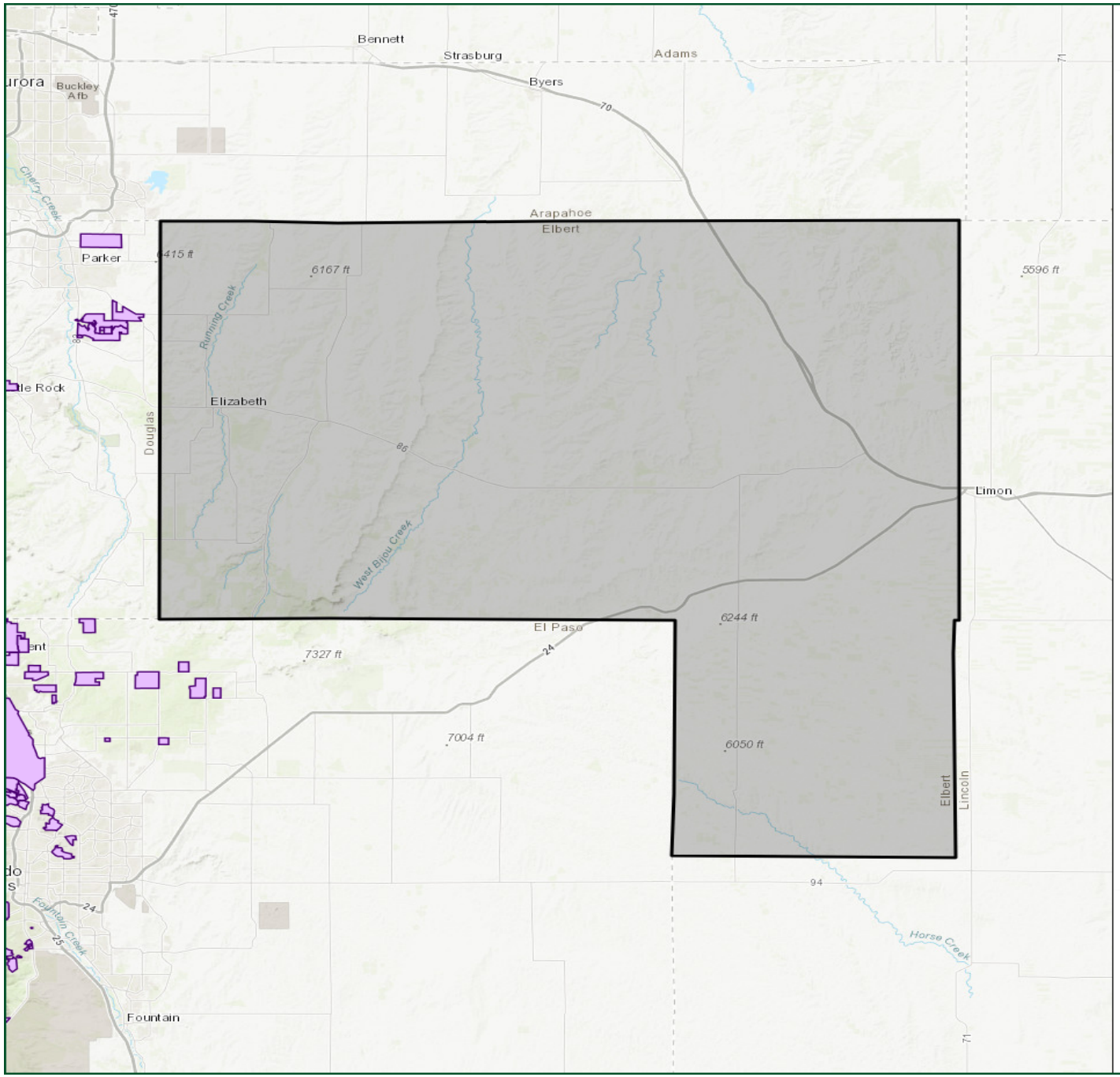


The Firewise USA® dataset defines the boundaries of the recognized communities. Mapping Firewise USA® boundaries will generally be completed by CSFS staff.

Note: These are estimated boundaries using a variety of methods with varying degrees of accuracy. These are not legal boundaries and should not be construed as such. The boundaries may overlap with CWPP areas and are subject to change over time as the communities develop, change, and continue to implement wildfire mitigation efforts.

To learn more about the Firewise USA® recognition program or to fill out an application, visit https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA - OR - https://csfs.colostate.edu/wildfire-mitigation/colorado-firewise-communities/

The designated area does not contain data for this section.



ElbertHMP

Fire Wise Communities

Fire Wise Communities 2018

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Community Wildfire Protection Plans (CWPPs)

Description

A Community Wildfire Protection Plan (CWPP) is a document developed and agreed upon by a community to identify how the community will reduce its wildfire risk. CWPPs identify areas where fuels reduction is needed to reduce wildfire threats to communities and critical infrastructure, address protection of homes and other structures, and plan for wildfire response capability. The Colorado State Forest Service (CSFS) supports the development and implementation of CWPPs and provides resources, educational materials and information to those interested in developing CWPPs.

The CWPP dataset represents the boundaries of those areas that have developed a CWPP. Note that CWPPs can be developed by different groups at varying scales, such as county, Fire Protection District (FPD), community/subdivision, HOA, etc., and as such, can overlap. In addition, the CWPPs can be from different dates. Often a county CWPP is completed first with subsequently more detailed CWPPs done for local communities within that county or FPD. CO-WRAP provides a tool that allows the user to select the CWPP area and retrieve the CWPP document for review (PDF).

At a minimum, a CWPP should include:

- The wildland-urban interface (WUI) boundary, defined on a map, where people, structures and other community values are most likely to be negatively impacted by wildfire
- The CSFS, local fire authority and local government involvement and any additional stakeholders
- A narrative that identifies the community's values and fuel hazards
- The community's plan for when a wildfire occurs
- An implementation plan that identifies areas of high priority for fuels treatments



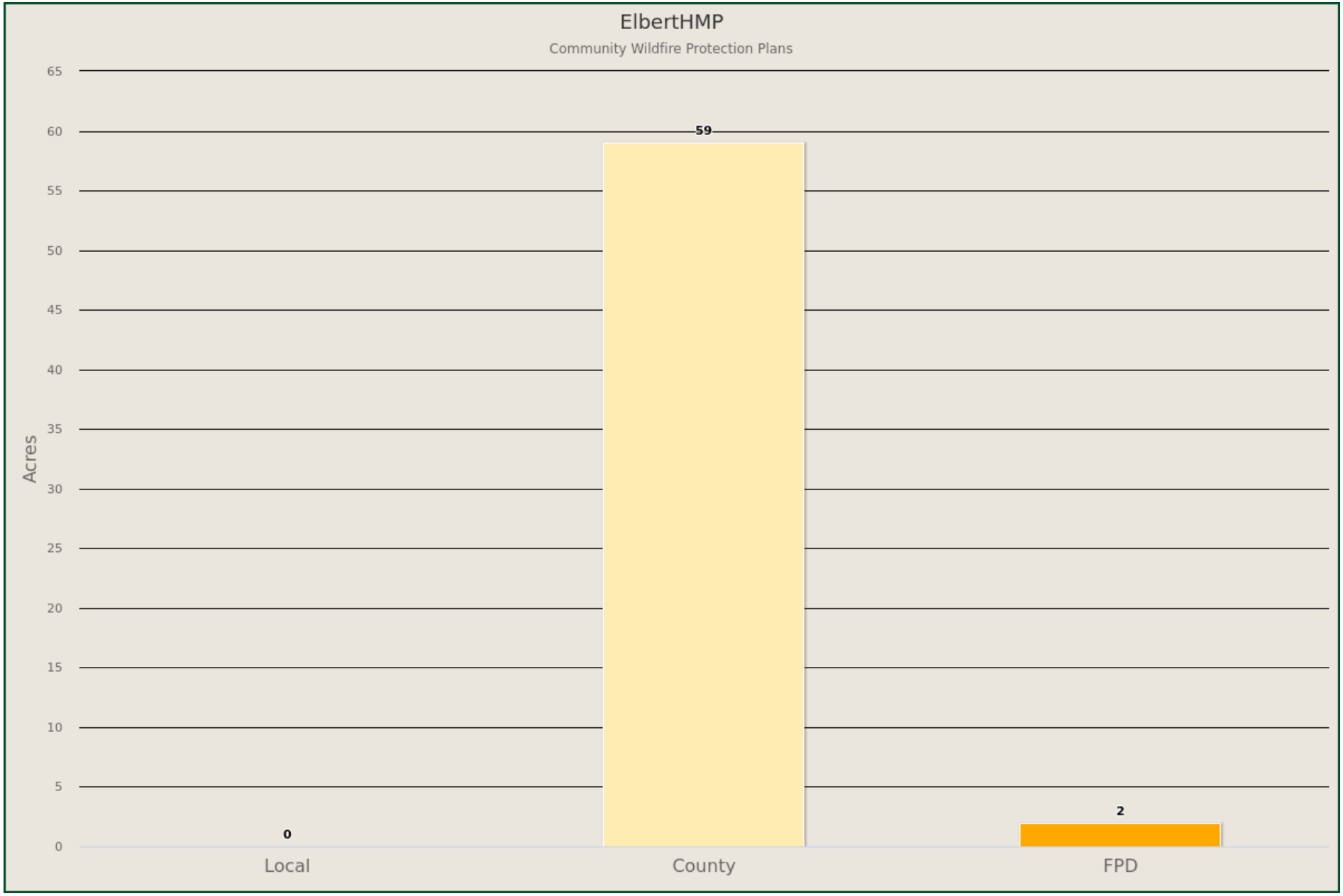
Community input is the foundation of a Community Wildfire Protection Plan that identfies community needs and garners community support.

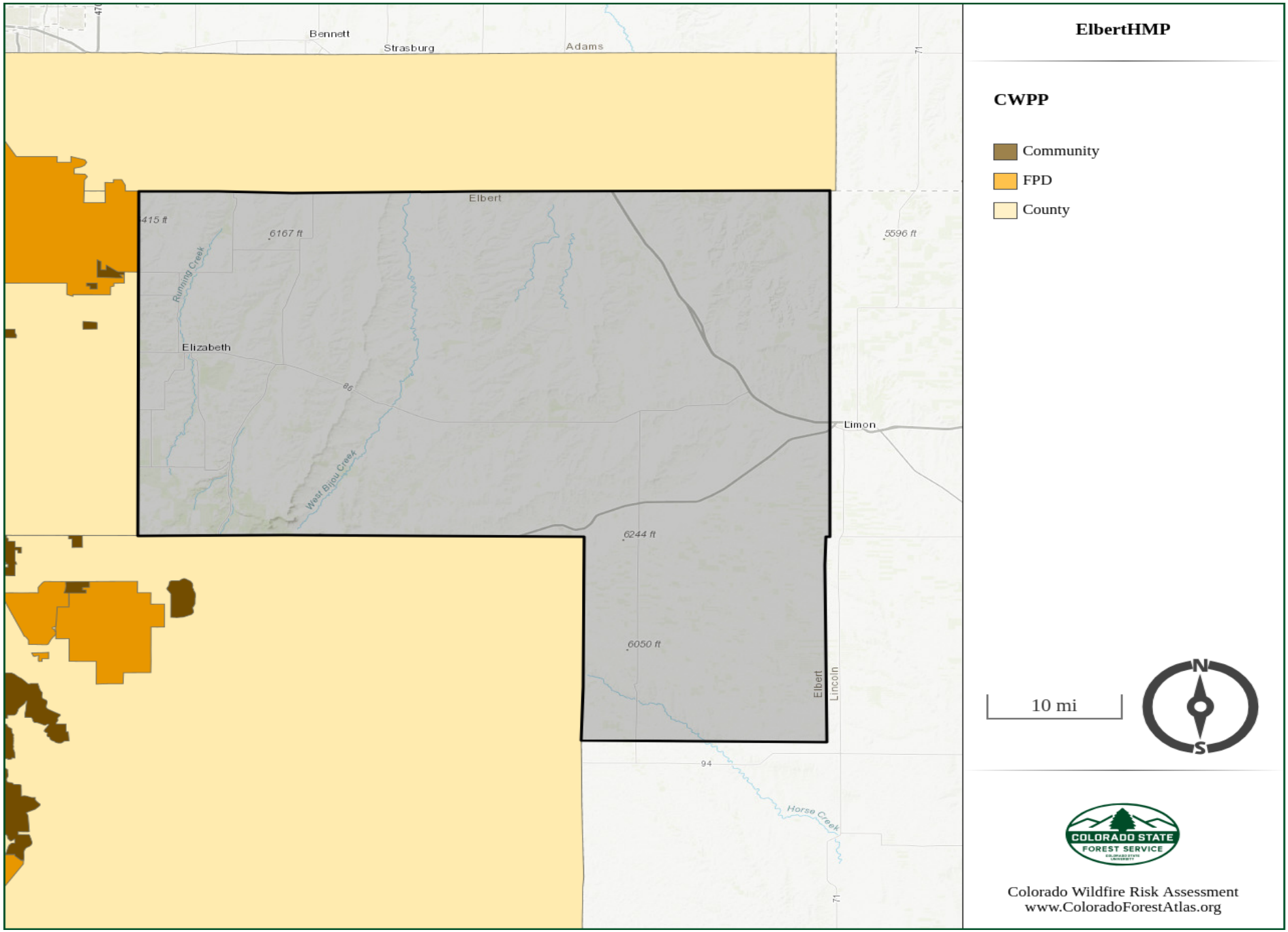
CWPPs are not shelf documents and should be reviewed, tracked and updated. A plan stays alive when it is periodically updated to address the accomplishments of the community. Community review of progress in meeting plan objectives and determining areas of new concern where actions must be taken to reduce wildfire risk helps the community stay current with changing environment and wildfire mitigation priorities.

If your community is in an area at risk from wildfire, now is a good time to start working with neighbors on a CWPP and preparing forfuture wildfires. Contact your local CSFS district to learn how to start this process and create a CWPP for your community: http://csfs.colostate.edu/pages/your-local-forester.html

For the ElbertHMP test project area, there are 4 CWPPs areas that are totally or partially in the defined project area.

Community CWPP Name	CWPP Type	CSFS District	Acres inside project area	Total Acres
Arapahoe County	County	Franktown	26	515,122
El Paso County	County	Woodland Park	13	1,361,915
Douglas County	County	Franktown	20	538,860
South Metro Fire Rescue Authority	FPD	Franktown	2	118,409
Total Acres			**61**	**2,534,306**


ElbertHMP
Community Wildfire Protection Plans
Acres
65
60
55
50
45
40
35
30
25
20
15
10
5
0
59
0
2
Local
County
FPD


ElbertHMP
CWPP
Community
FPD
County
Bennett
Strasburg
Adams
Elbert
Elizabeth
Limon
Running Creek
West Bijou Creek
Horse Creek
6167 ft
5596 ft
6244 ft
6050 ft
Elbert
Lincoln
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Wildfire Risk

Description

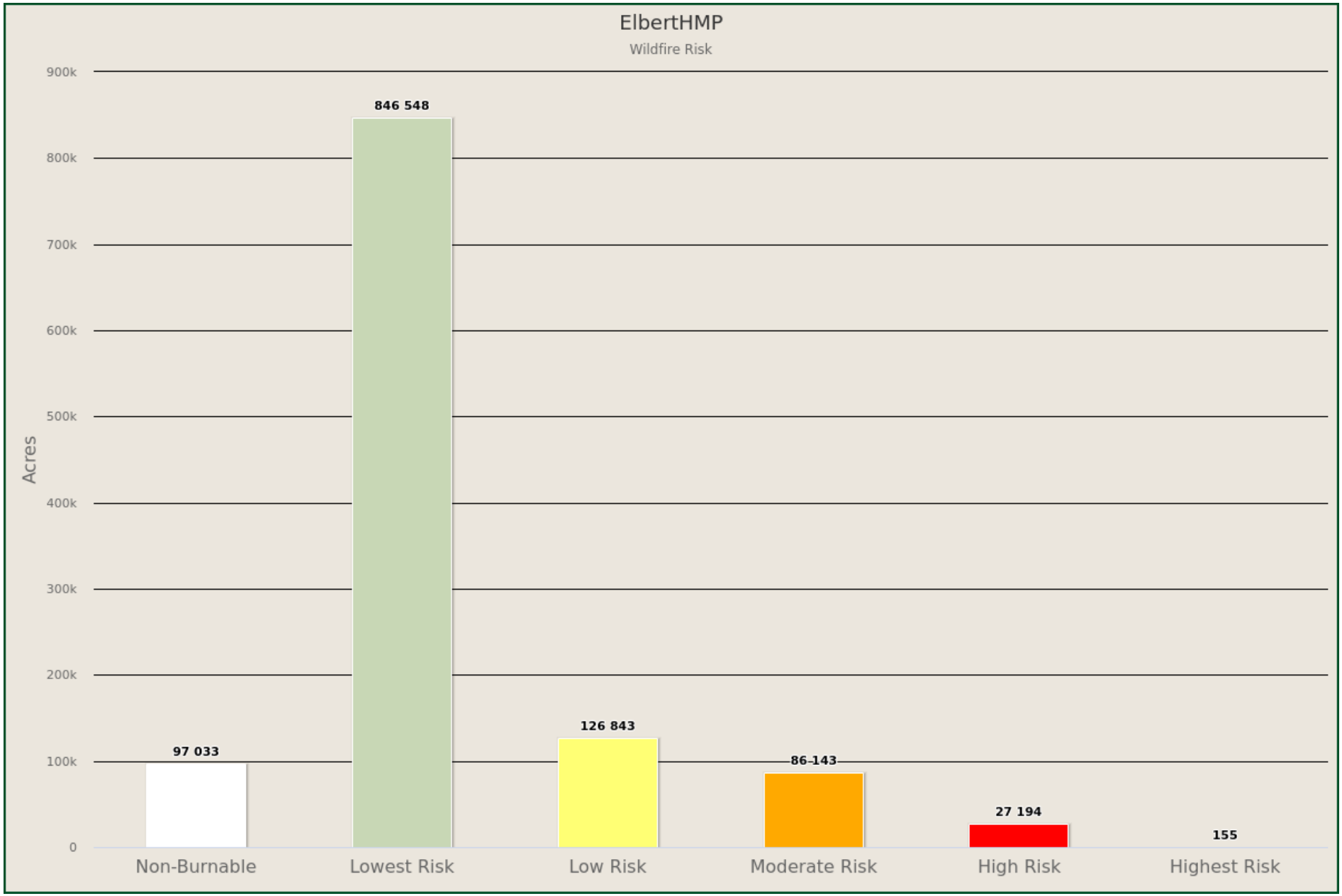
Wildfire Risk is a composite risk rating obtained by combining the probability of a fire occurring with the individual values at risk layers. Risk is defined as the possibility of loss or harm occurring from a wildfire. It identifies areas with the greatest potential impacts from a wildfire – i.e. those areas most at risk - considering all values and assets combined together – WUI Risk, Drinking Water Risk, Forest Assets Risk and Riparian Areas Risk.

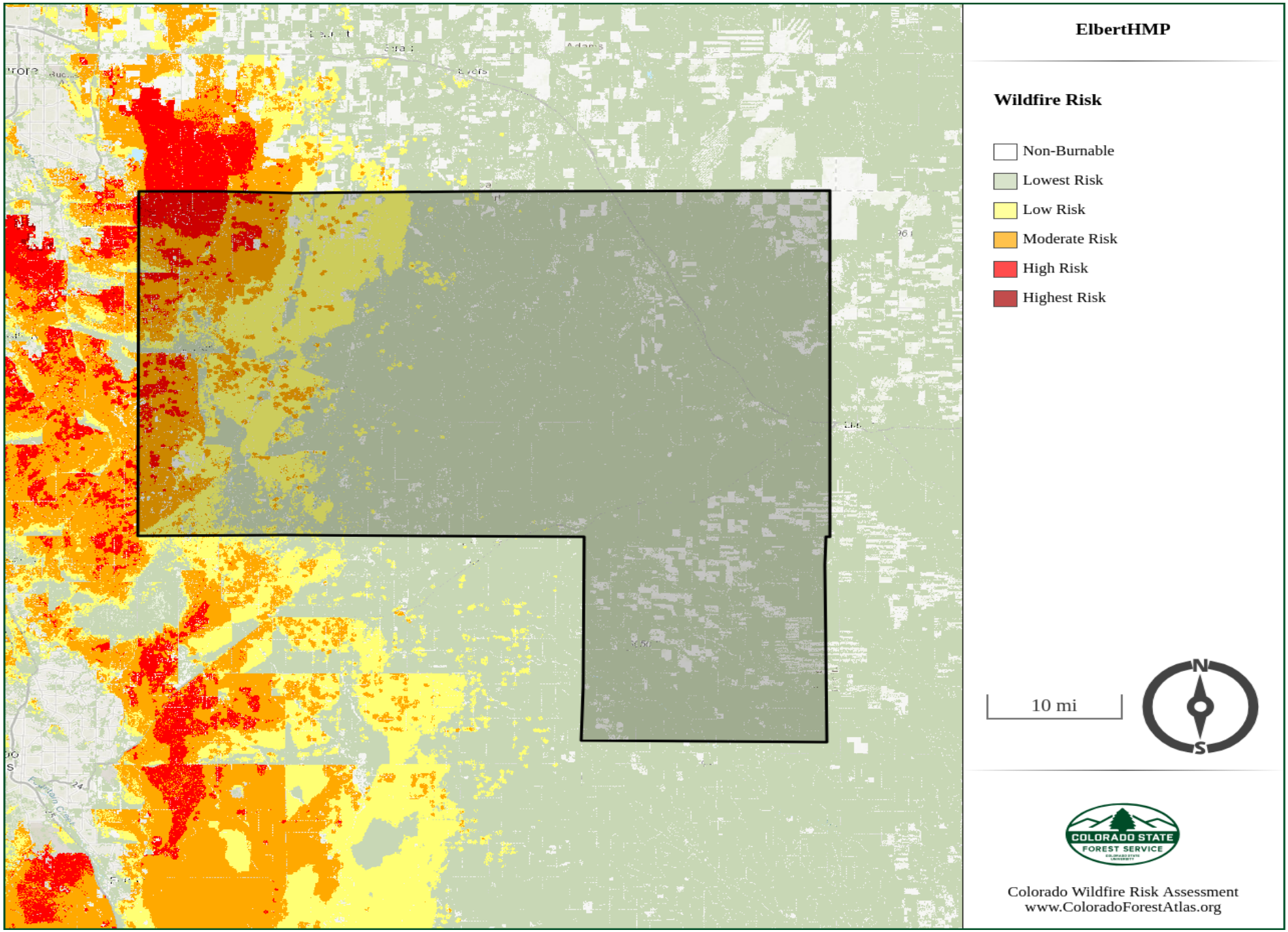
Since all areas in Colorado have risk calculated consistently, it allows for comparison and ordination of areas across the entire state. The Values at Risk Rating is a key component of Wildfire Risk. The Values at Risk Rating is comprised of several inputs focusing on values and assets at risk. This includes Wildland Urban Interface, Forest Assets, Riparian Assets and Drinking Water Importance Areas (watersheds).

To aid in the use of Wildfire Risk for planning activities, the output values are categorized into five (5) classes. These are given general descriptions from Lowest to Highest Risk.

Wildfire Risk Class		Acres	Percent
	Non-Burnable	97,033	8.2 %
	Lowest Risk	846,548	71.5 %
	Low Risk	126,843	10.7 %
	Moderate Risk	86,143	7.3 %
	High Risk	27,194	2.3 %
	Highest Risk	155	0.0 %
Total		**1,183,916**	**100 %**




ElbertHMP
Wildfire Risk
Acres
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
97 033
846 548
126 843
86-143
27 194
155
Non-Burnable
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk


ElbertHMP
Wildfire Risk
Non-Burnable
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
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Burn Probability

Description

Burn Probability (BP) is the annual probability of any location burning due to a wildfire. BP is calculated as the number of times that a 30-meter cell on the landscape is burned from millions of fire simulations. The annual BP was estimated by using a stochastic (Monte Carlo) wildfire simulation approach with Technosylva's Wildfire Analyst software (www.WildfireAnalyst.com).

A total number of 3,200,000 fires were simulated across the state, including those fires outside the Colorado border which were used in a buffer area around the state, to compute BP with a mean ignition density of 8.68 fires/km2. The simulation ignition points were spatially distributed evenly every 500 meters across the state. Only high and extreme weather conditions were used to run the simulations. All fires simulations had a duration of 10 hours.

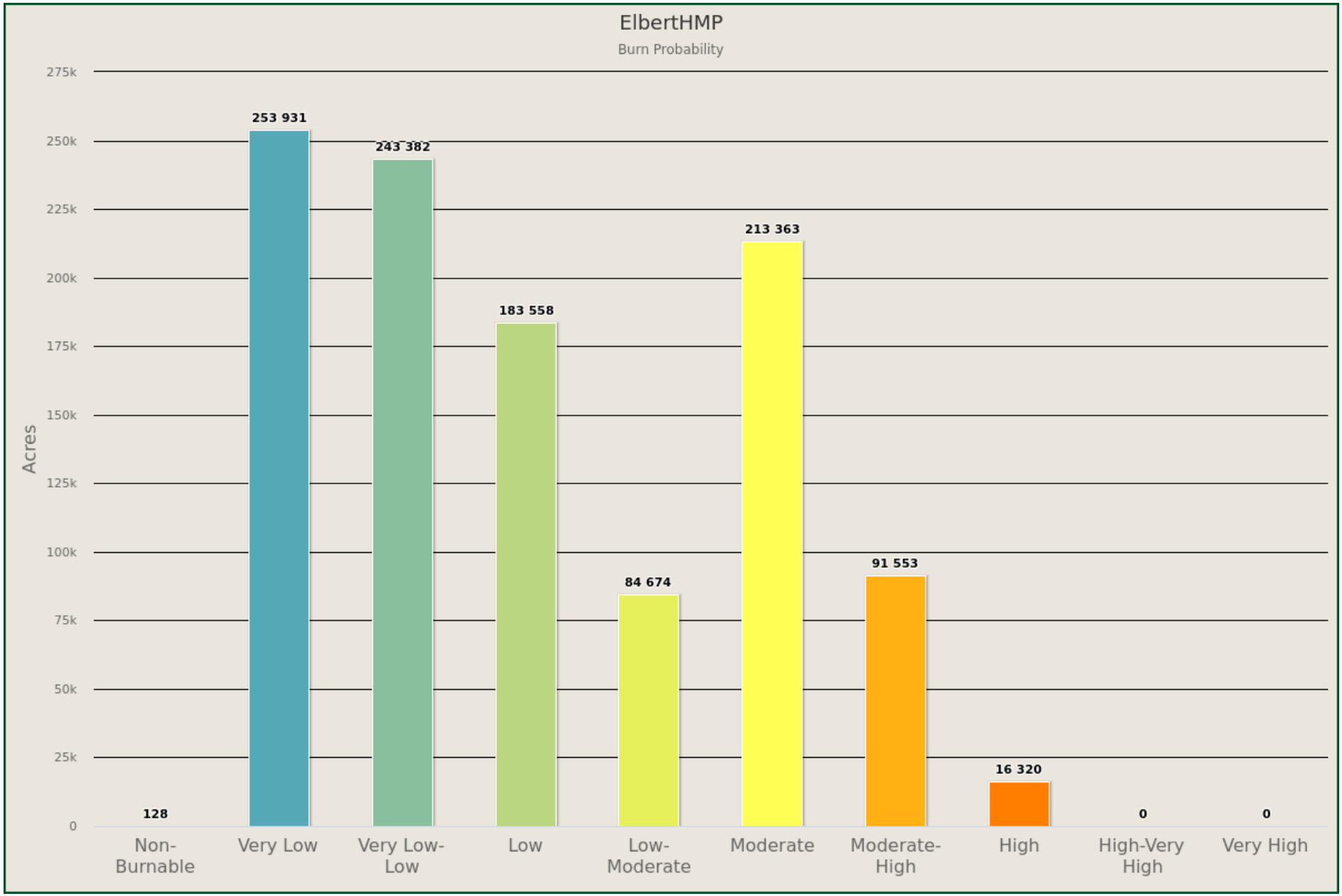
The Wildfire Analyst fire simulator considered the number of times that the simulated fires burned each cell. After that, results were weighted by considering the historical fire occurrence of those fires that burned in high and extreme weather conditions. The weighting was done by assessing the relationship between the annual historical fire ignition density in Colorado and the total number of simulated fires with varying input data in the different weather scenarios and the historical spatial distribution of the ignition points.

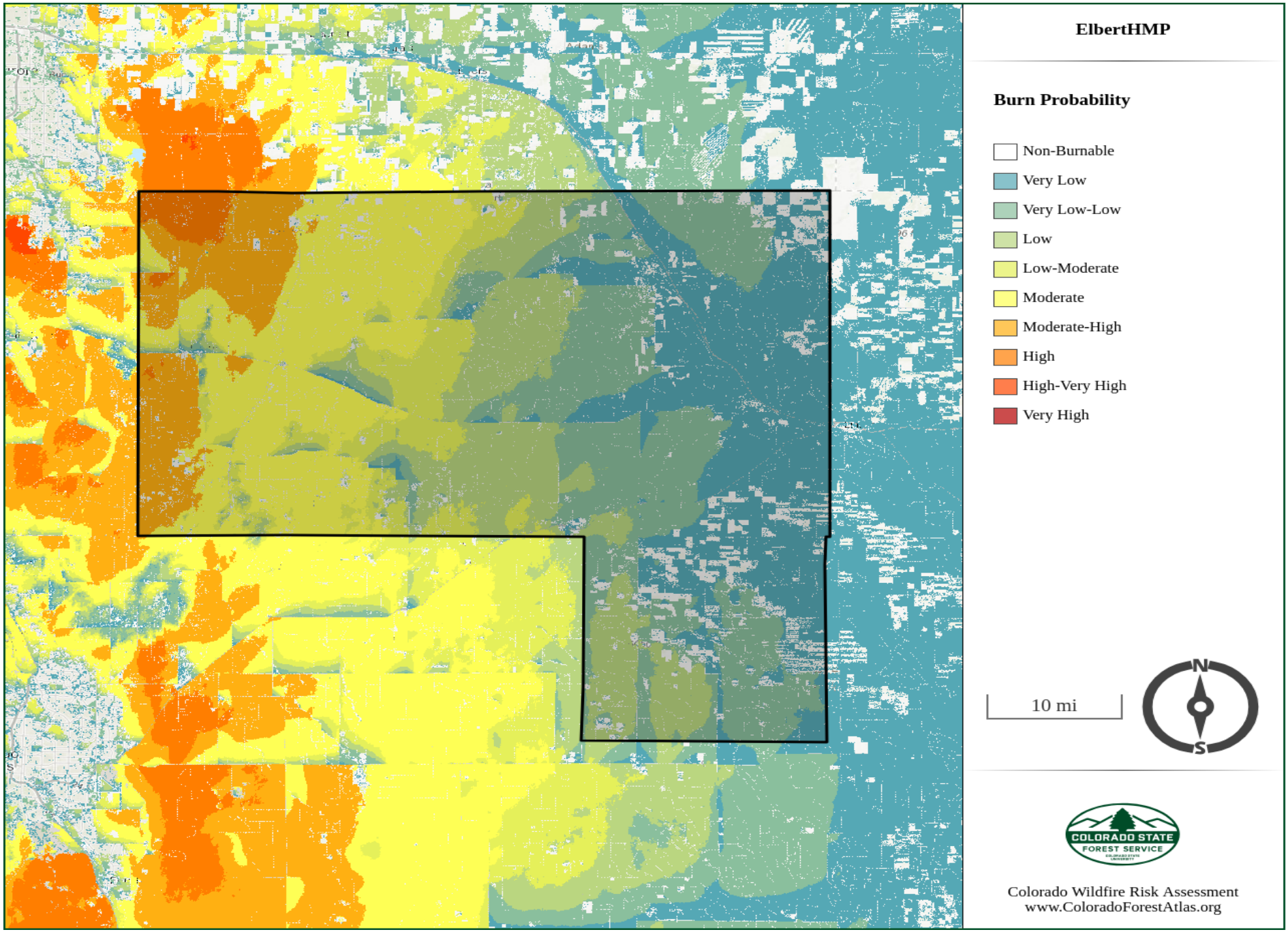
The probability map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention planning.

To aid in the use of Burn Probability for planning activities, the output values are categorized into 10 (ten) classes. These are given general descriptions from Lowest to Highest Probability.

A more detailed description of the risk assessment algorithms is provided in the Colorado WRA Final Report, which can be downloaded from www.ColoradoForestAtlas.org.

Burn Probability Class	Acres	Percent
Non-Burnable	128	0.0 %
Very Low	253,931	23.4 %
Very Low-Low	243,382	22.4 %
Low	183,558	16.9 %
Low-Moderate	84,674	7.8 %
Moderate	213,363	19.6 %
Moderate-High	91,553	8.4 %
High	16,320	1.5 %
High-Very High	0	0 %
Very High	0	0 %
Total	**1,086,908**	**100 %**


ElbertHMP
Burn Probability
Acres
275k
250k
225k
200k
175k
150k
125k
100k
75k
50k
25k
0
128
253 931
243 382
183 558
84 674
213 363
91 553
16 320
0
0
Non-Burnable
Very Low
Very Low-Low
Low
Low-Moderate
Moderate
Moderate-High
High
High-Very High
Very High


ElbertHMP
Burn Probability
Non-Burnable
Very Low
Very Low-Low
Low
Low-Moderate
Moderate
Moderate-High
High
High-Very High
Very High
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Values at Risk Rating

Description

Represents those values or assets that would be adversely impacted by a wildfire. The Values at Risk Rating is an overall rating that combines the risk ratings for Wildland Urban Interface (WUI), Forest Assets, Riparian Assets, and Drinking Water Importance Areas into a single measure of values-at-risk. The individual ratings for each value layer were derived using a Response Function approach.

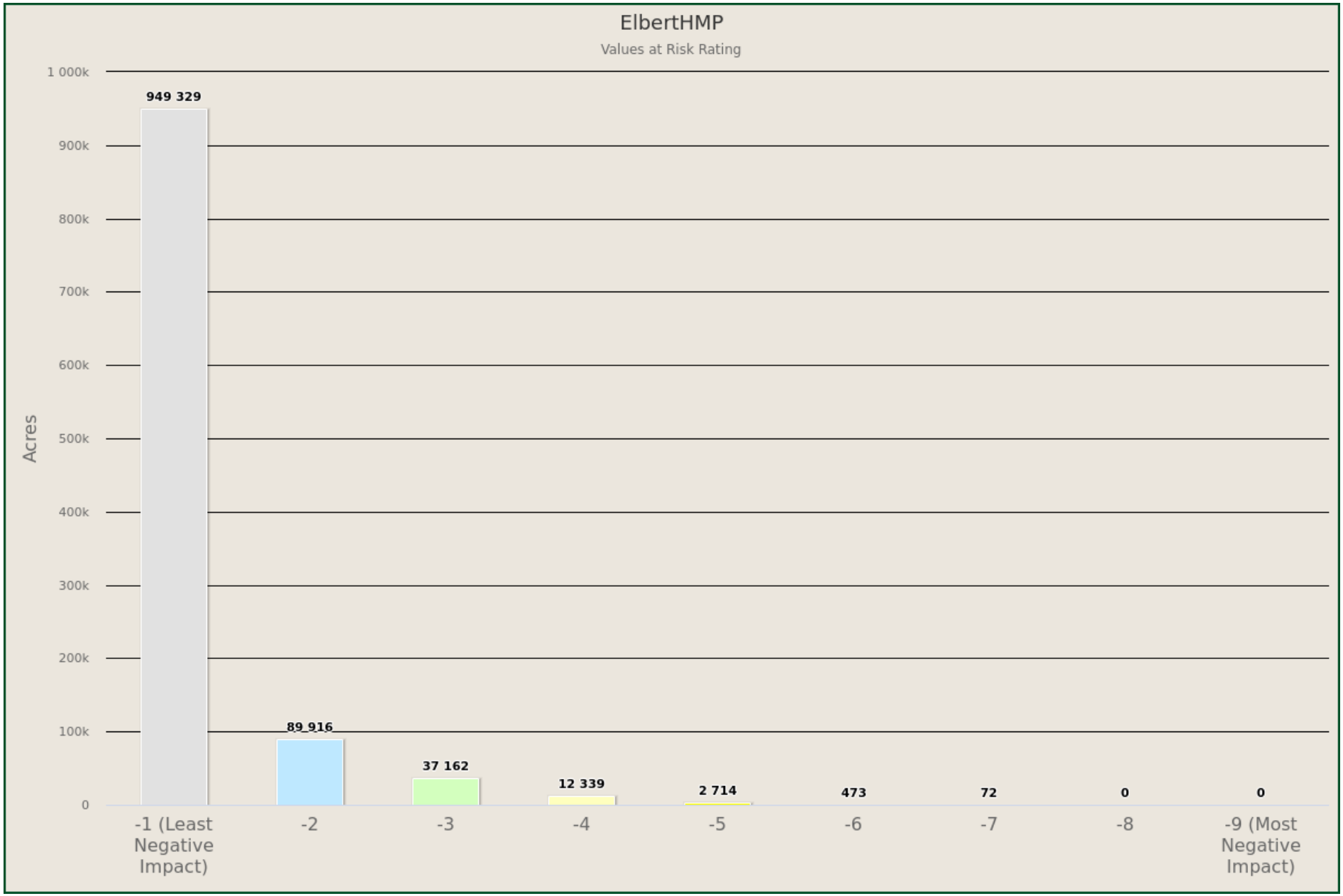
Response functions are a method of assigning a net change in the value to a resource or asset based on susceptibility to fire at different intensity levels. A resource or asset is any of the Fire Effects input layers, such as WUI, Forest Assets, etc. These net changes can be adverse (negative) or positive (beneficial).

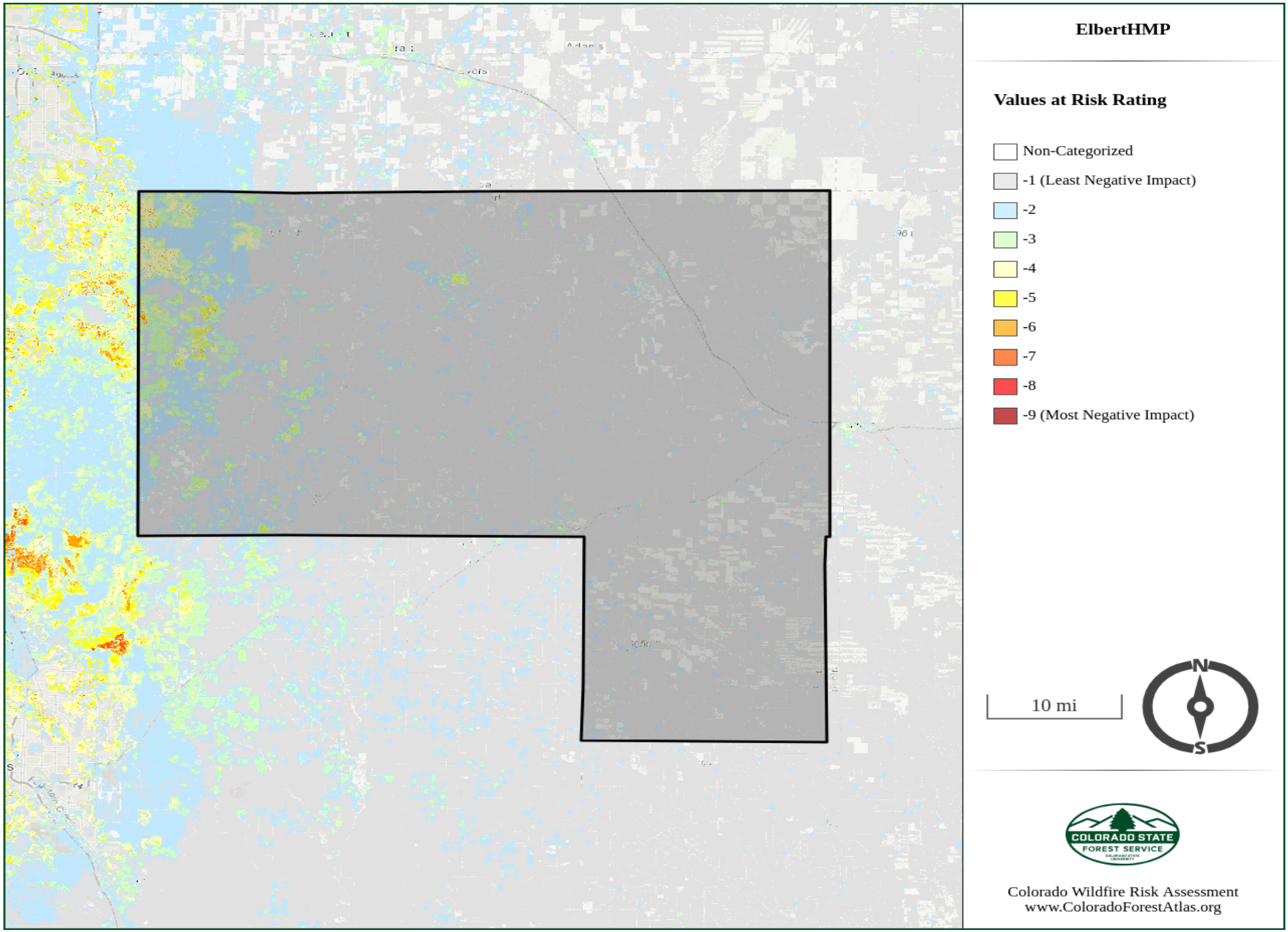
Calculating the Values at Risk Rating at a given location requires spatially defined estimates of the intensity of fire integrated with the identified resource value. This interaction is quantified through the use of response functions that estimate expected impacts to resources or assets at the specified fire intensity levels. The measure of fire intensity level used in the Colorado assessment is flame length for a location. Response Function outputs were derived for each input dataset and then combined to derive the Values Impacted Rating.

Different weightings are used for each of the input layers with the highest priority placed on protection of people and structures (i.e. WUI). The weightings represent the value associated with those assets. Weightings were developed by a team of experts during the assessment to reflect priorities for fire protection planning in Colorado. Refer to the Colorado WRA Final Report for more information about the layer weightings.

Since all areas in Colorado have the Values at Risk Rating calculated consistently, it allows for comparison and ordination of areas across the entire state. The data were derived at a 30-meter resolution.

Values at Risk Class	Acres	Percent
-1 (Least Negative Impact)	949,329	86.9 %
-2	89,916	8.2 %
-3	37,162	3.4 %
-4	12,339	1.1 %
-5	2,714	0.2 %
-6	473	0.0 %
-7	72	0.0 %
-8	0	0 %
-9 (Most Negative Impact)	0	0 %
Total	**1,092,006**	**100 %**


ElbertHMP
Values at Risk Rating
Acres
1 000k
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
949 329
89 916
37 162
12 339
2 714
473
72
0
0
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)


ElbertHMP
Values at Risk Rating
Non-Categorized
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)
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Suppression Difficulty Rating

Description

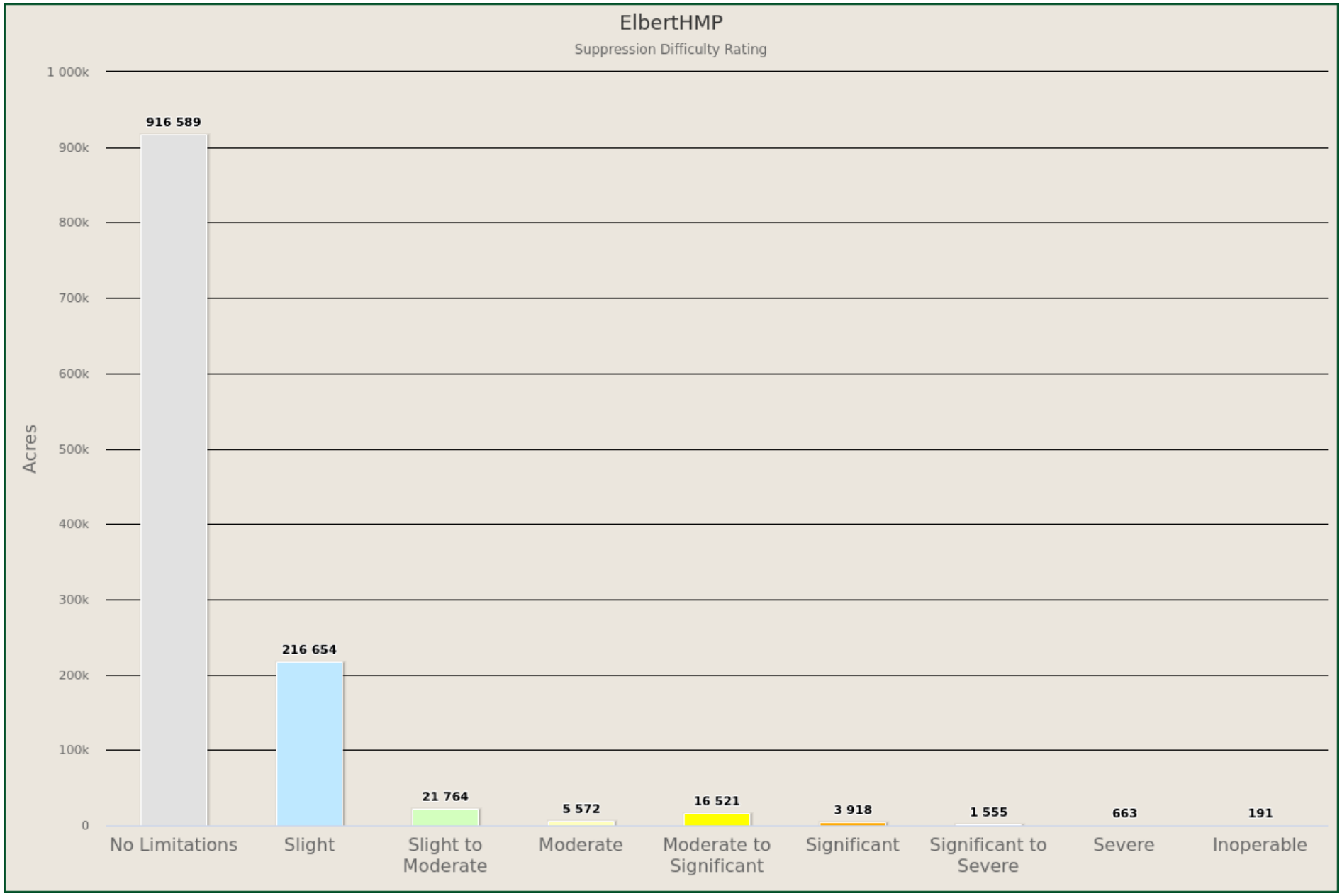
Reflects the difficulty or relative cost to suppress a fire given the terrain and vegetation conditions that may impact machine operability. This layer is an overall index that combines the slope steepness and the vegetation/fuel type characterization to identify areas where it would be difficult or costly to suppress a fire due to the underlying terrain and vegetation conditions that would impact machine operability (in particular Type II dozer).

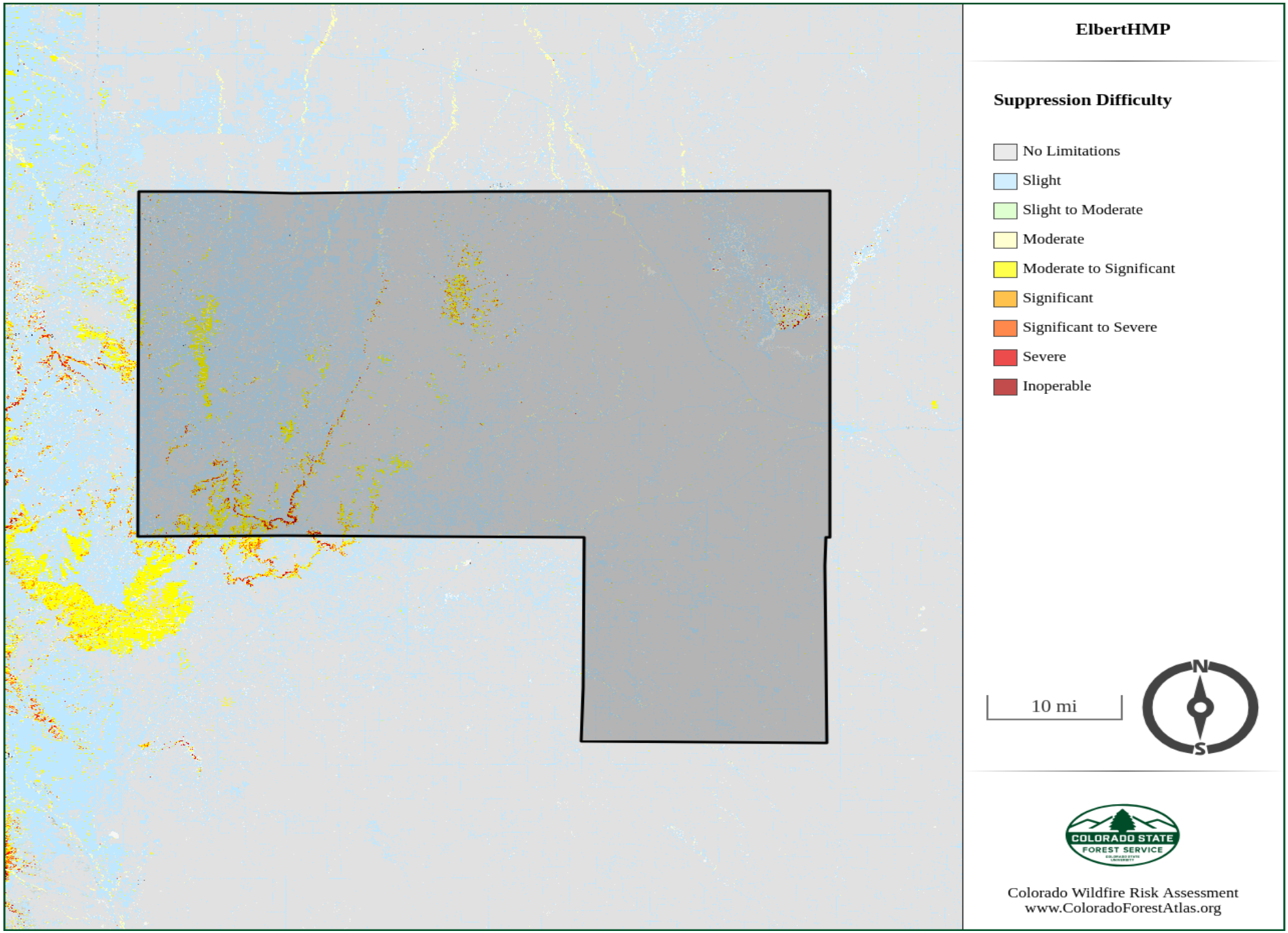
The rating was calculated based on the fireline production rates for hand crews and engines with modifications for slope, as documented in the NWCG Fireline Handbook 3, PMS 401-1.

The burnable fuel models in the Colorado WRA were grouped into ten categories: Grass, Grass/Shrub, Shrub/Regeneration, Moderate Forest, Heavy Forest, Swamp/Marsh, Agriculture, Barren, Urban/Developed, Water/Ice.

Fireline production capability on six slope classes was used as the basic reference to obtain the suppression difficulty score. The response function category is assigned to each combination of fuel model group and slope category.

SDR Class	Acres	Percent
No Limitations	916,589	77.5 %
Slight	216,654	18.3 %
Slight to Moderate	21,764	1.8 %
Moderate	5,572	0.5 %
Moderate to Significant	16,521	1.4 %
Significant	3,918	0.3 %
Significant to Severe	1,555	0.1 %
Severe	663	0.1 %
Inoperable	191	0.0 %
Total	**1,183,428**	**100 %**


ElbertHMP
Suppression Difficulty Rating
Acres
1 000k
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
916 589
216 654
21 764
5 572
16 521
3 918
1 555
663
191
No Limitations
Slight
Slight to Moderate
Moderate
Moderate to Significant
Significant
Significant to Severe
Severe
Inoperable


ElbertHMP
Suppression Difficulty
No Limitations
Slight
Slight to Moderate
Moderate
Moderate to Significant
Significant
Significant to Severe
Severe
Inoperable
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Fire Occurrence

Description

Fire Occurrence is an ignition density that represents the likelihood of a wildfire starting based on historical ignition patterns. Occurrence is derived by modeling historic wildfire ignition locations to create an ignition density map.

Historic fire report data were used to create the ignition points for all Colorado fires. The compiled fire occurrence database was cleaned to remove duplicate records and to correct inaccurate locations. The database was then modeled to create a density map reflecting historical fire ignition rates.

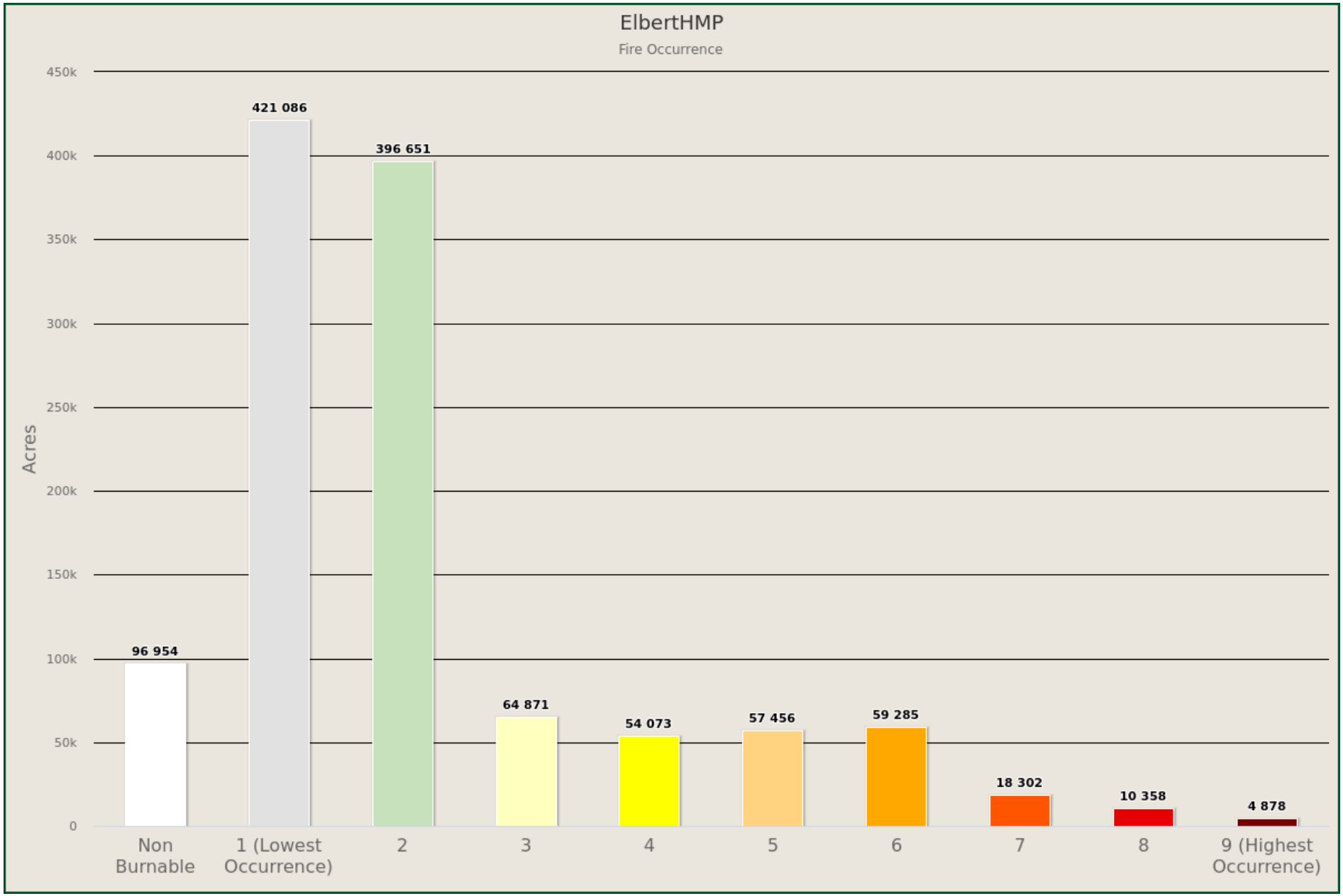
Historic fire report data were used to create the ignition points for all Colorado fires. This included both federal and non-federal fire ignition locations.

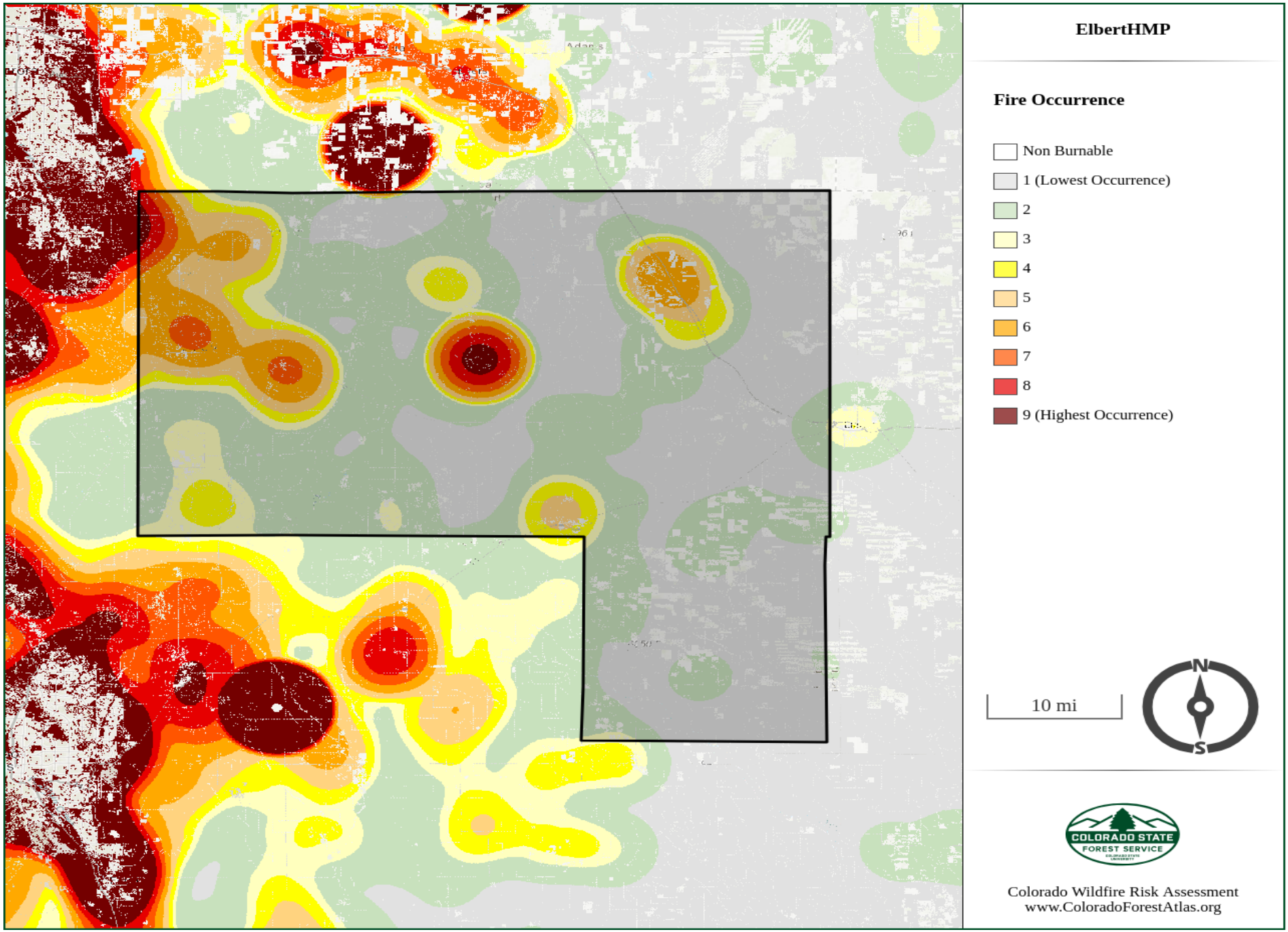
The class breaks are determined by analyzing the Fire Occurrence output values for the entire state and determining cumulative percent of acres (i.e. Class 9 has the top 1.5% of acres with the highest occurrence rate). Refer to the Colorado WRA Final Report for a more detailed description of the mapping classes and the methods used to derive these.

The Fire Occurrence map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not sufficient for site specific analysis, it is appropriate for regional, county or local protection mitigation or prevention planning.

A more detailed description of the risk assessment algorithms is provided in the Colorado WRA Final Report, which can be downloaded from www.ColoradoForestAtlas.org.

Fire Occurrence Class	Acres	Percent
Non Burnable	96,954	8.2 %
1 (Lowest Occurrence)	421,086	35.6 %
2	396,651	33.5 %
3	64,871	5.5 %
4	54,073	4.6 %
5	57,456	4.9 %
6	59,285	5.0 %
7	18,302	1.5 %
8	10,358	0.9 %
9 (Highest Occurrence)	4,878	0.4 %
Total	**1,183,916**	**100 %**


ElbertHMP
Fire Occurrence
Acres
450k
400k
350k
300k
250k
200k
150k
100k
50k
0
96 954
421 086
396 651
64 871
54 073
57 456
59 285
18 302
10 358
4 878
Non Burnable
1 (Lowest Occurrence)
2
3
4
5
6
7
8
9 (Highest Occurrence)


ElbertHMP
Fire Occurrence
Non Burnable
1 (Lowest Occurrence)
2
3
4
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6
7
8
9 (Highest Occurrence)
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Fire Behavior

Description

Fire behavior is the manner in which a fire reacts to the following environmental influences:



1. **Fuels**
2. **Weather**
3. **Topography**

Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Colorado WRA include fire type, rate of spread, flame length and fireline intensity (fire intensity scale). These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

Fuels

The Colorado WRA includes composition and characteristics for both surface fuels and canopy fuels. Assessing canopy fire potential and surface fire potential allows identification of areas where significant increases in fire behavior affects the potential of a fire to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

1. **Surface Fuels** are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter, and 4) slash. They are generally referred to as fire behavior fuel models and provide the input parameters needed to compute surface fire behavior. The 2017 assessment uses the latest 2017 calibrated fuels for Colorado.
2. **Canopy Cover** is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind-reduction factors and shading.
3. **Canopy Ceiling Height/Stand Height** is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height is the average height of the dominant and co-dominant trees in a stand. It is used to compute wind reduction to mid-flame height, and spotting distances from torching trees.
4. **Canopy Base** Height is the lowest height above the ground above which sufficient canopy fuel exists to vertically propagate fire (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand or group of trees, not an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuels, such as tall shrubs and small trees. Canopy base height is used to determine whether a surface fire will transition to a canopy fire.



5. **Canopy Bulk Density** is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot or group of trees, not an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

Weather

Environmental weather parameters needed to compute fire behavior characteristics include 1-hour, 10-hour and 100-hour time-lag fuel moistures, herbaceous fuel moisture, woody fuel moisture and the 20-foot, 10-minute average wind speed. To collect this information, Weather data (1988-2017) from NCEP (National Center for Environmental Prediction) was used to analyse potential weather scenarios in which assessing fire behavior and spread. In particular, the North American Regional Reanalysis (NARR) product from NCEP was selected because of it provides high resolution weather data for all of Colorado. The following percentiles (97th, 90th, 50th and 25th) were analysed for each variable in each 30km NARR point to create four weather scenarios to run the fire behavior analysis: “Extreme”, “High”, “Moderate” and “Low”. After computing the weather percentiles of the NARR variables, an IDW algorithm was used to derive 30m resolution data to match the surface fuels dataset.

The four percentile weather categories are intended to represent low, moderate, high and extreme fire weather days. Fire behavior outputs are computed for each percentile weather category to determine fire potential under different weather scenarios.

For a detailed description of the methodology, refer to the 2017 Colorado Wildfire Risk Assessment Final Report at www.ColoradoForestAtlas.org.

Topography

Topography datasets required to compute fire behavior characteristics are elevation, slope and aspect.

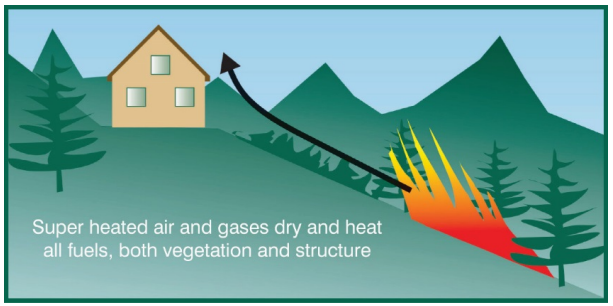
FIRE BEHAVIOR CHARACTERISTICS

Fire behavior characteristics provided in this report include:

- **Characteristic Rate of Spread**
- **Characteristic Flame Length**
- **Fire Intensity Scale**
- **Fire Type – Extreme Weather**

Characteristic Rate of Spread

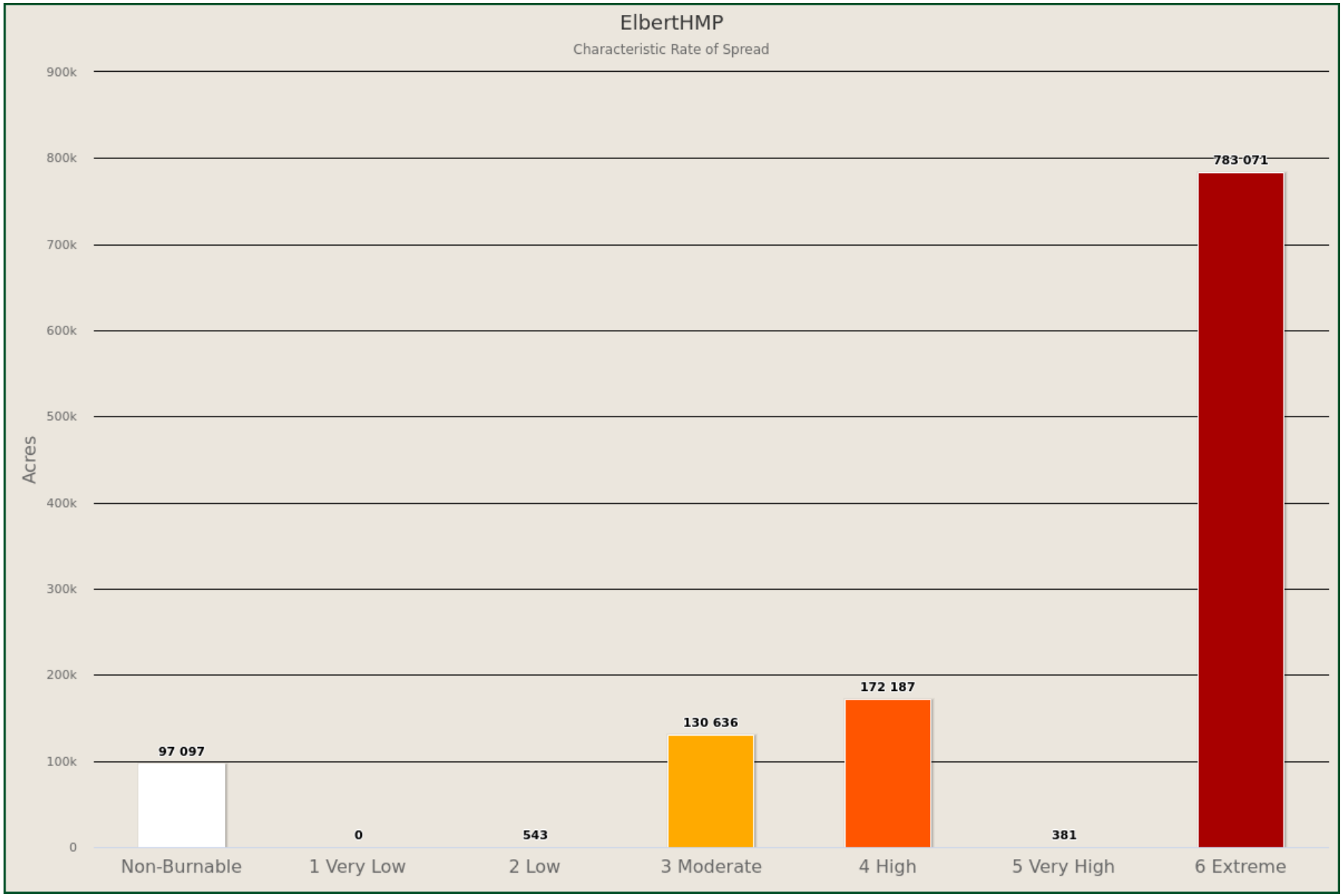
Characteristic Rate of Spread is the typical or representative rate of spread of a potential fire based on a weighted average of four percentile weather categories. Rate of spread is the speed with which a fire moves in a horizontal direction across the landscape, usually expressed in chains per hour (ch/hr) or feet per minute (ft/min). For purposes of the Colorado WRA, this measurement represents the maximum rate of spread of the fire front. Rate of Spread is used in the calculation of Wildfire Threat in the Colorado WRA.

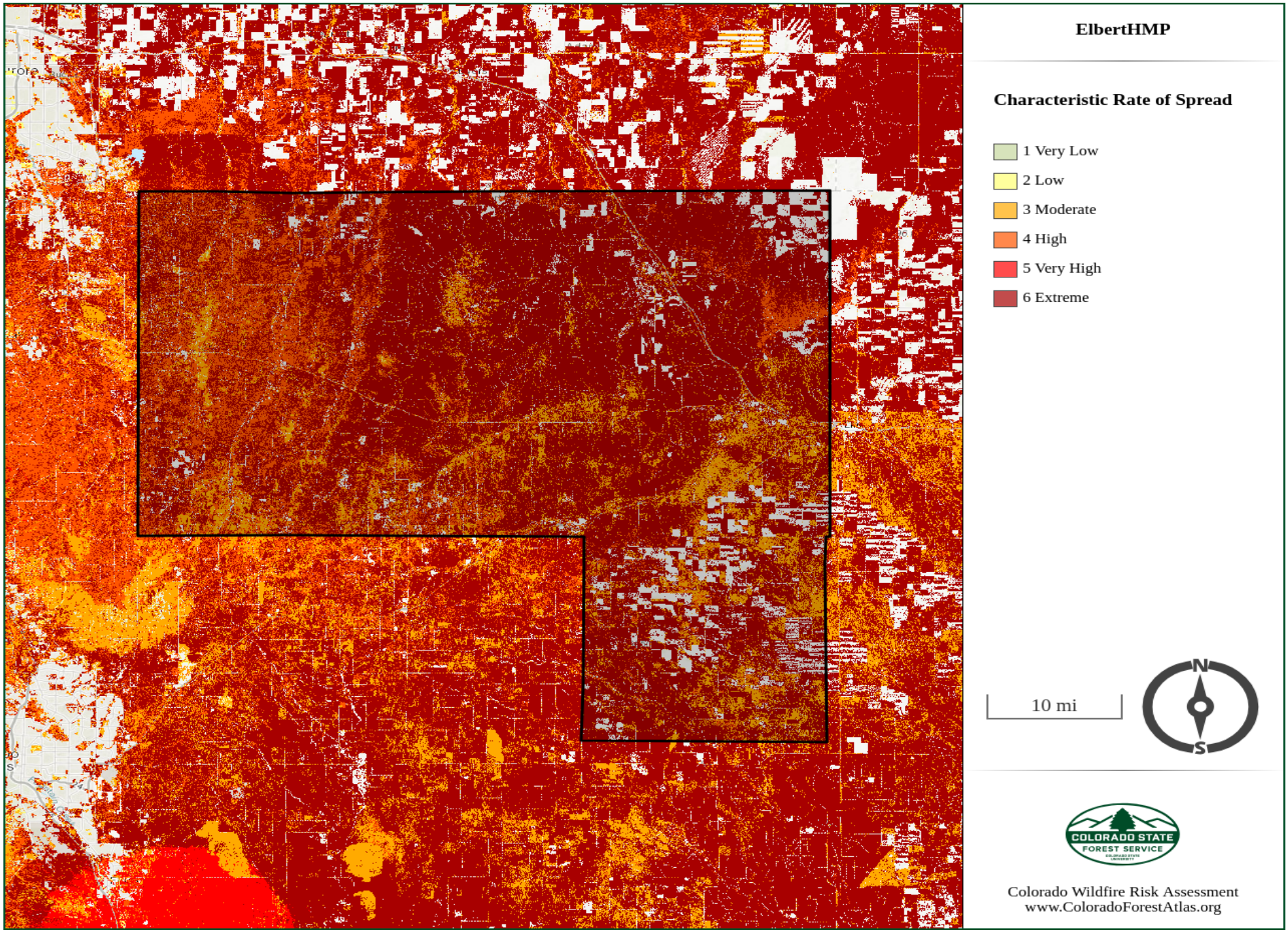


Rate of spread is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 30-meter cell in Colorado. Thirty (30) meter resolution is the baseline for the Colorado WRA, matching the source surface fuels dataset.

The “characteristic” output represents the weighted average for all four weather percentiles. While not shown in this report, the individual percentile weather ROS outputs are available in the Colorado WRA data.

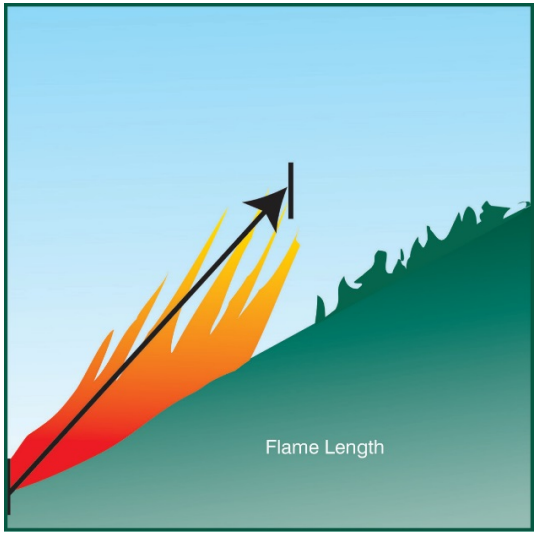
Rate of Spread	Acres	Percent
Non-Burnable	97,097	8.2 %
1 Very Low	0	0.0 %
2 Low	543	0.0 %
3 Moderate	130,636	11.0 %
4 High	172,187	14.5 %
5 Very High	381	0.0 %
6 Extreme	783,071	66.1 %
Total	**1,183,916**	**100 %**


ElbertHMP
Characteristic Rate of Spread
Acres
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
97 097
0
543
130 636
172 187
381
783 071
Non-Burnable
1 Very Low
2 Low
3 Moderate
4 High
5 Very High
6 Extreme


ElbertHMP
Characteristic Rate of Spread
1 Very Low
2 Low
3 Moderate
4 High
5 Very High
6 Extreme
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Characteristic Flame Length

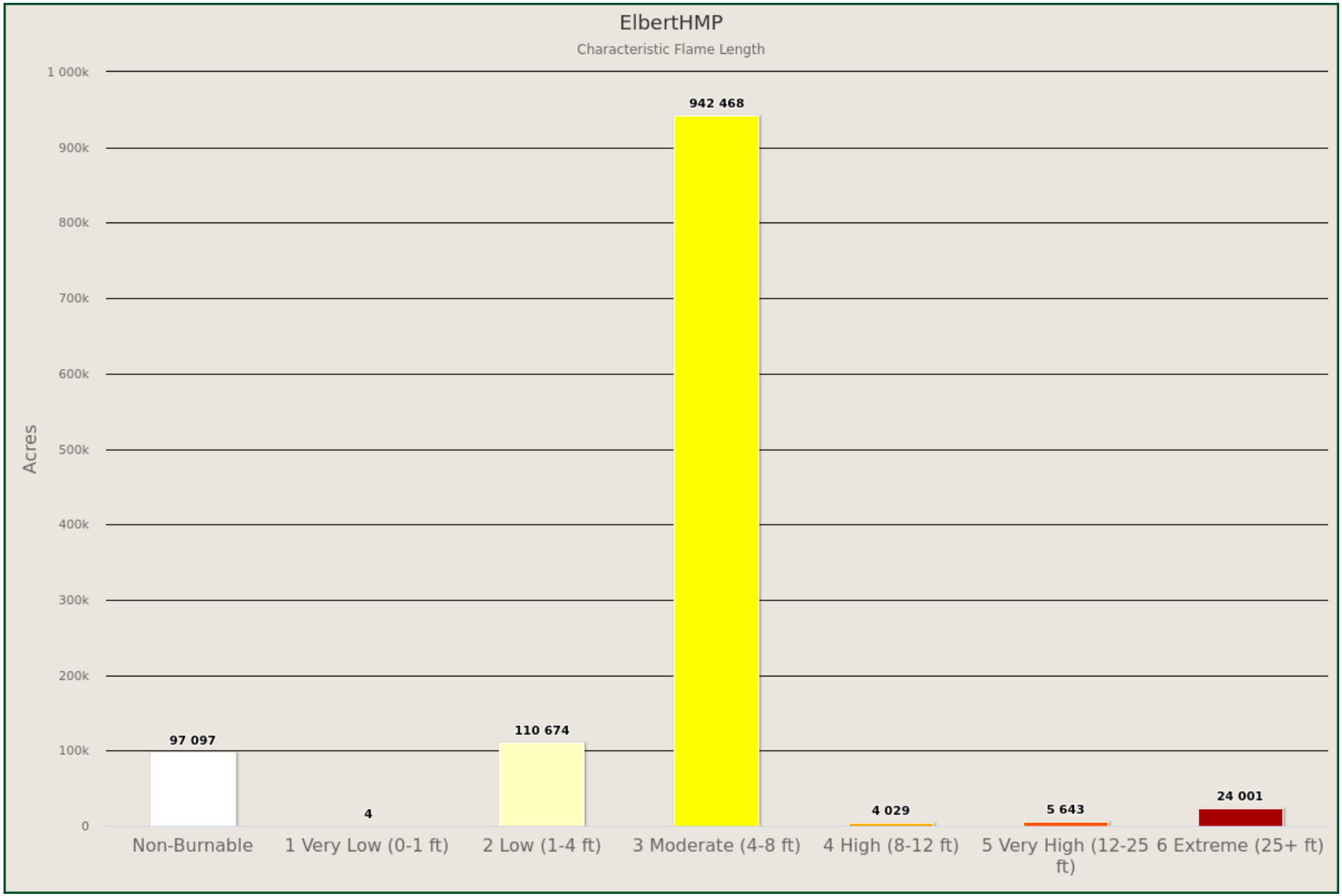
Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet (ft). Flame length is the measure of fire intensity used to generate the Fire Effects outputs for the Colorado WRA.

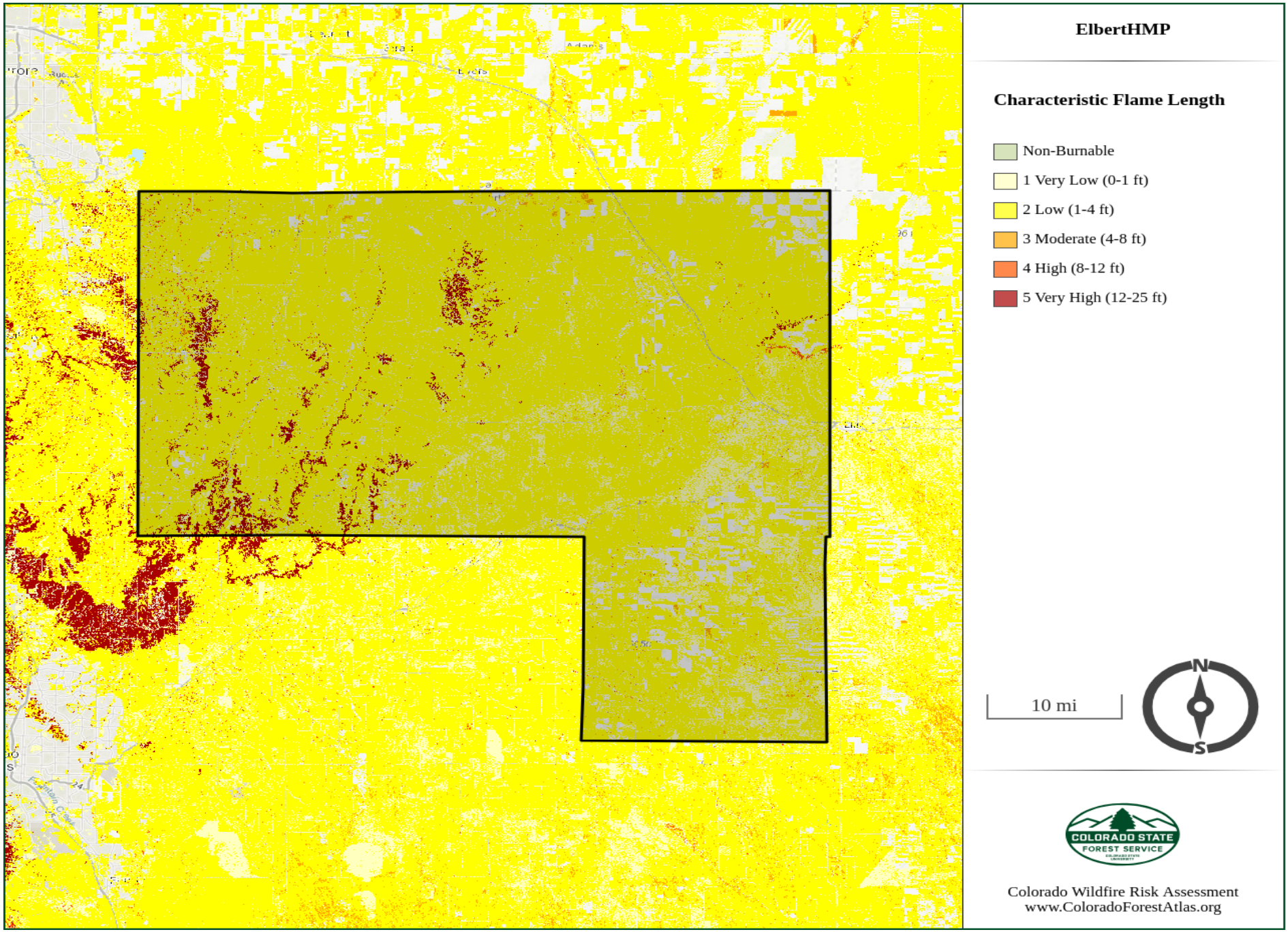


Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 30-meter cell in Colorado.

This output represents the weighted average for all four weather percentiles. While not shown in this report, the individual percentile weather Flame Length outputs are available in the Colorado WRA data.

Flame Length	Acres	Percent
Non-Burnable	97,097	8.2 %
1 Very Low (0-1 ft)	4	0.0 %
2 Low (1-4 ft)	110,674	9.3 %
3 Moderate (4-8 ft)	942,468	79.6 %
4 High (8-12 ft)	4,029	0.3 %
5 Very High (12-25 ft)	5,643	0.5 %
6 Extreme (25+ ft)	24,001	2.0 %
Total	**1,183,916**	**100 %**


ElbertHMP
Characteristic Flame Length
Acres
1 000k
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
97 097
4
110 674
942 468
4 029
5 643
24 001
Non-Burnable
1 Very Low (0-1 ft)
2 Low (1-4 ft)
3 Moderate (4-8 ft)
4 High (8-12 ft)
5 Very High (12-25 ft)
6 Extreme (25+ ft)


ElbertHMP
Characteristic Flame Length
Non-Burnable
1 Very Low (0-1 ft)
2 Low (1-4 ft)
3 Moderate (4-8 ft)
4 High (8-12 ft)
5 Very High (12-25 ft)
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Fire Intensity Scale

Description

Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist. Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of five (5) classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities.

1. **Class 1, Lowest Intensity:**

   Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

2. **Class2, Low:**

   Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. **Class 3, Moderate:**

   Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

4. **Class 4, High:**

   Large Flames, up to 30 feet in length; short-range spotting 1. common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

5. **Class 5, Highest Intensity:**

   Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Burn Probability and Fire Intensity Scale are designed to complement each other. The Fire Intensity Scale does not incorporate historical occurrence information. It only evaluates the potential fire behavior for an area, regardless if any fires have occurred there in the past. This additional information allows mitigation planners to quickly identify areas where dangerous fire behavior potential exists in relationship to nearby homes or other valued assets.

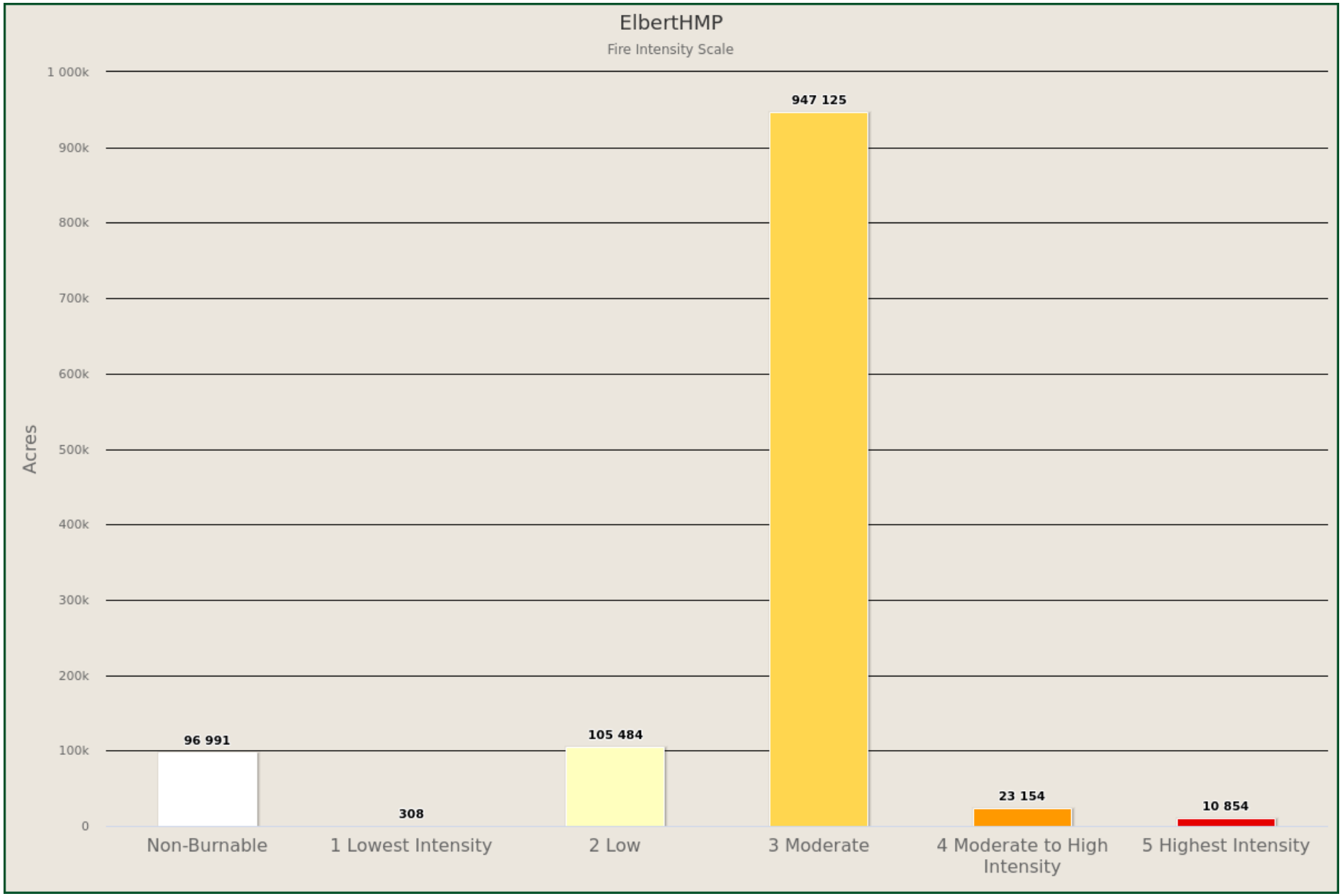
Since all areas in Colorado have fire intensity scale calculated consistently, it allows for comparison and ordination of areas across the entire state. For example, a high fire intensity area in Eastern Colorado is equivalent to a high fire intensity area in Western Colorado.

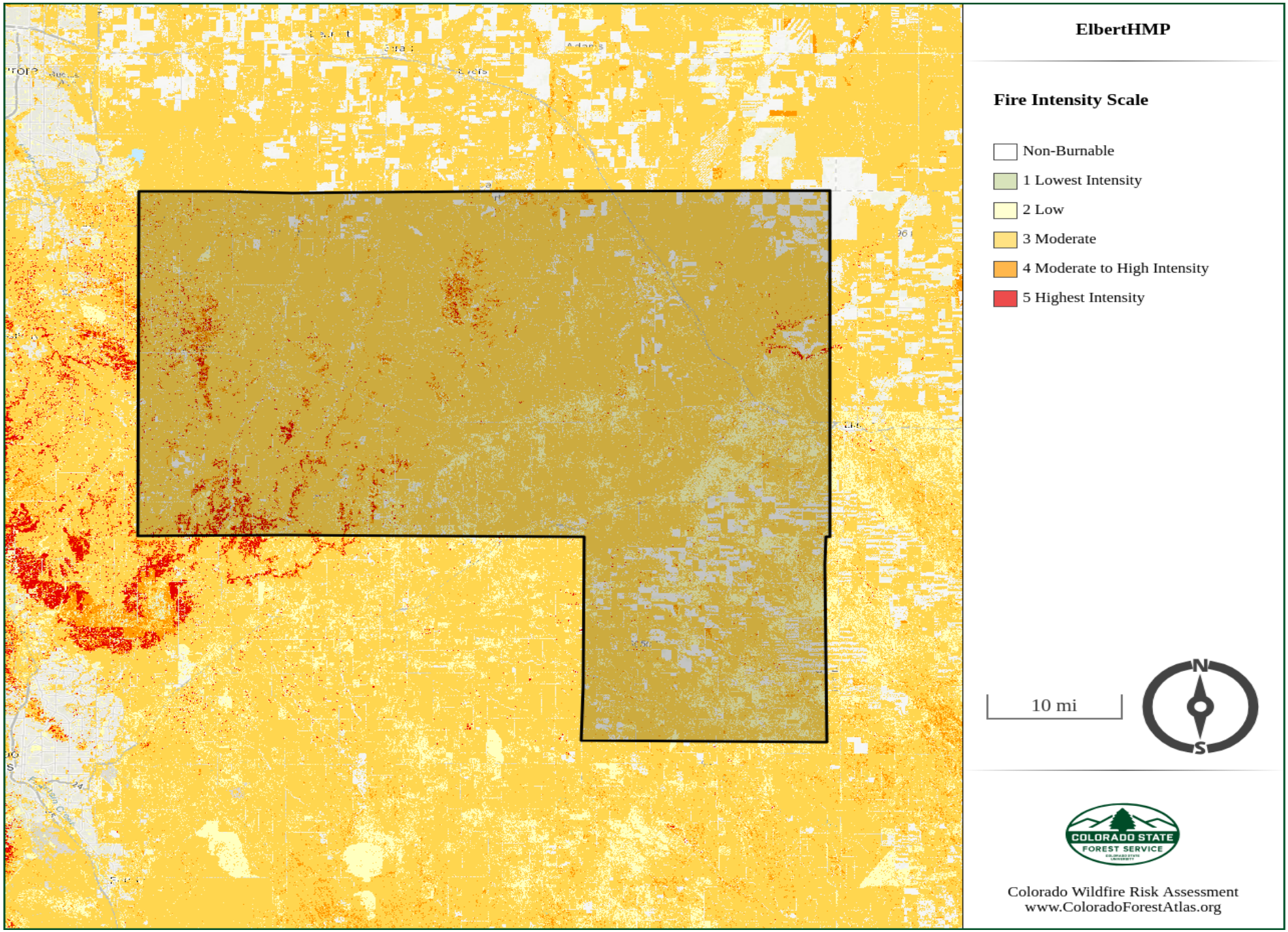
Fire intensity scale is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently.

To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each 30-meter cell in Colorado. The FIS represents the weighted average for all four weather percentiles.

The fire intensity scale map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.

FIS Class	Acres	Percent
Non-Burnable	96,991	8.2 %
1 Lowest Intensity	308	0.0 %
2 Low	105,484	8.9 %
3 Moderate	947,125	80.0 %
4 Moderate to High Intensity	23,154	2.0 %
5 Highest Intensity	10,854	0.9 %
Total	**1,183,916**	**100 %**


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Fire Intensity Scale
Acres
1 000k
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
96 991
308
105 484
947 125
23 154
10 854
Non-Burnable
1 Lowest Intensity
2 Low
3 Moderate
4 Moderate to High Intensity
5 Highest Intensity


ElbertHMP
Fire Intensity Scale
Non-Burnable
1 Lowest Intensity
2 Low
3 Moderate
4 Moderate to High Intensity
5 Highest Intensity
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Fire Type – Extreme Weather

Fire Type – Extreme represents the potential fire type under the extreme percentile weather category. The extreme percentile weather category represents the average weather based on the top three percent fire weather days in the analysis period. It is not intended to represent a worst-case scenario weather event. Accordingly, the potential fire type is based on fuel conditions, extreme percentile weather, and topography.

Canopy fires are very dangerous, destructive and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measure can be taken if necessary. Typically canopy fires occur in extreme weather conditions. The Fire Type – Extreme layer shows the footprint of where these areas are most likely to occur. However, it is important to note that canopy fires are not restricted to these areas. Under the right conditions, it can occur in other canopied areas.

There are two primary fire types – surface fire and canopy fire. Canopy fire can be further subdivided into passive canopy fire and active canopy fire. A short description of each of these is provided below.

Surface Fire

A fire that spreads through surface fuel without consuming any overlying canopy fuel. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground.





Passive Canopy Fire

A type of crown fire in which the crowns of individual trees or small groups of trees burn, but solid flaming in the canopy cannot be maintained except for short periods (Scott & Reinhardt, 2001).





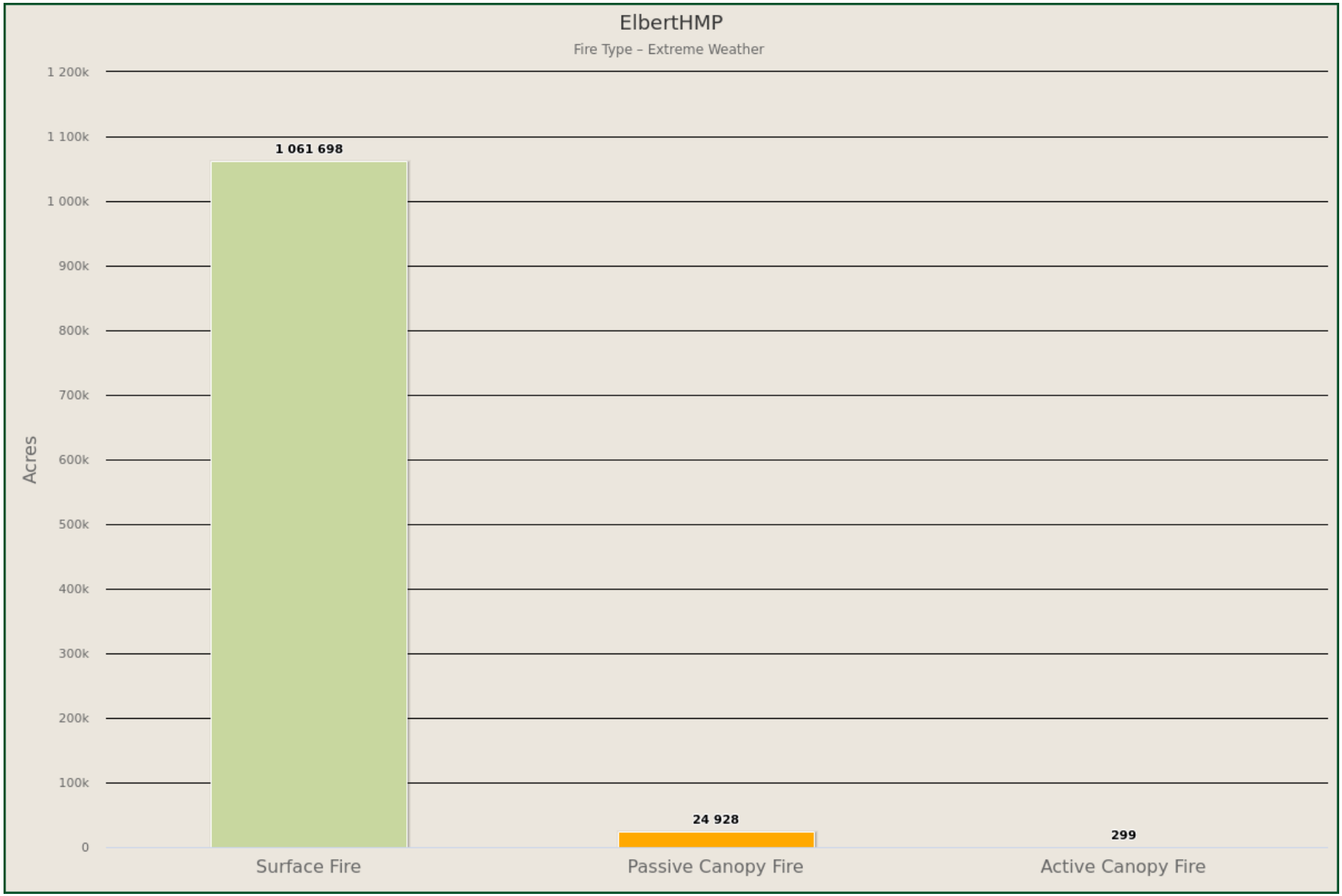
Active Canopy Fire

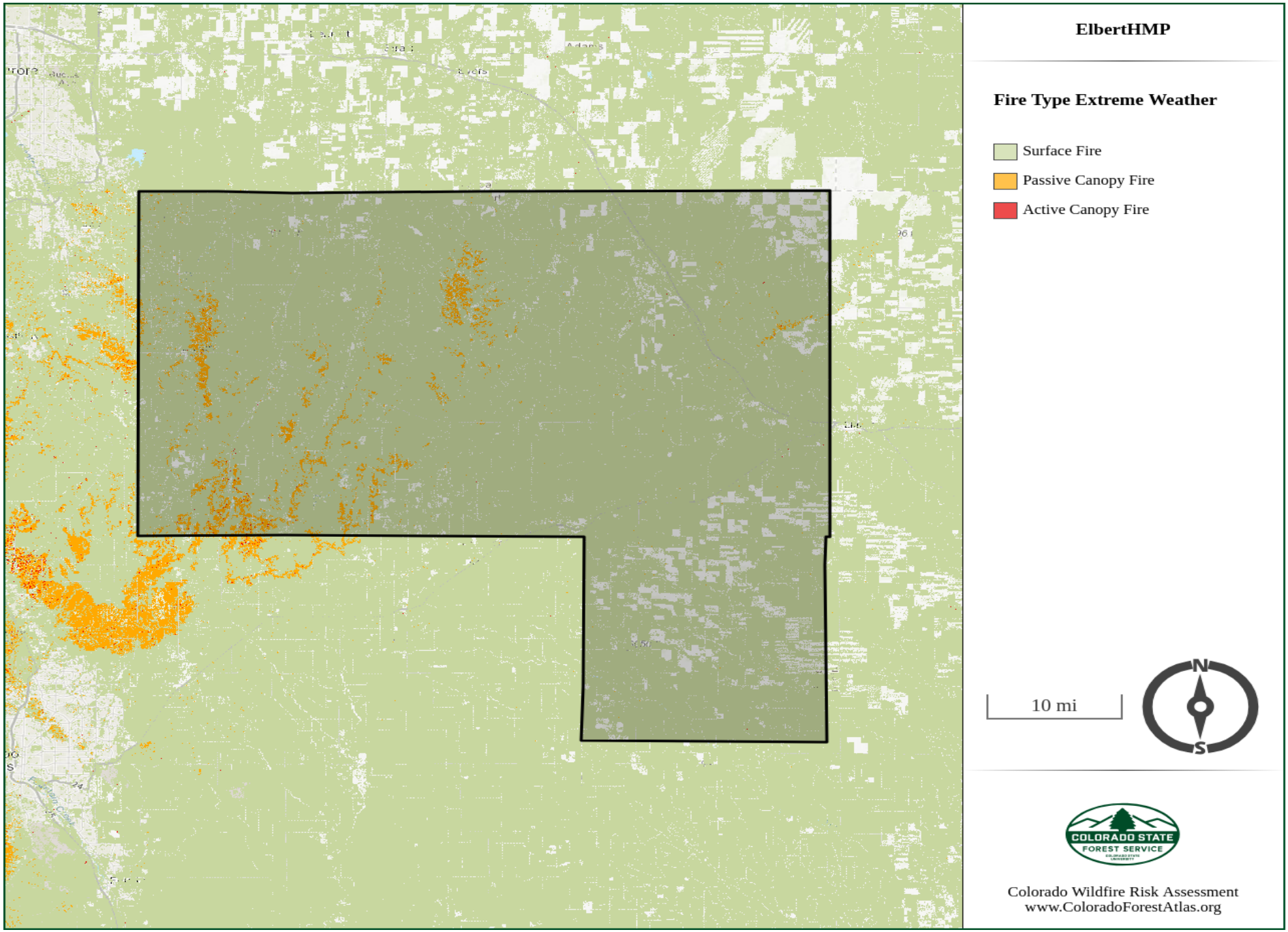
A crown fire in which the entire fuel complex (canopy) is involved in flame, but the crowning phase remains dependent on heat released from surface fuel for continued spread (Scott & Reinhardt, 2001).

The Fire Type - Extreme Weather map is derived at a 30-meter resolution. This scale of data was chosen to be consistent with the accuracy of the primary surface fuels dataset used in the assessment. While not appropriate for site specific analysis, it is appropriate for regional, county or local planning efforts.



Fire Type - Extreme Weather	Acres	Percent
Surface Fire	1,061,698	97.7 %
Passive Canopy Fire	24,928	2.3 %
Active Canopy Fire	299	0.0 %
Total	**1,086,924**	**100 %**


ElbertHMP
Fire Type – Extreme Weather
Acres
1 200k
1 100k
1 000k
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
1 061 698
24 928
299
Surface Fire
Passive Canopy Fire
Active Canopy Fire


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Fire Type Extreme Weather
Surface Fire
Passive Canopy Fire
Active Canopy Fire
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Surface Fuels

Description

Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters required by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, including rate of spread, flame length, fireline intensity and other fire behavior metrics. As the name might suggest, surface fuels account only for surface fire potential. Canopy fire potential is computed through a separate but linked process. The Colorado WRA accounts for both surface and canopy fire potential in the fire behavior outputs. However, only surface fuels are shown in this risk report.

Surface fuels typically are categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter, and 4) slash. Two standard fire behavior fuel model sets have been published. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models, and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott & Burgan, 2005) contains 40 fuel models. The Colorado WRA uses fuel models from the 2005 Fuel Model Set.



Unmanaged forest with dead and downed trees and branches

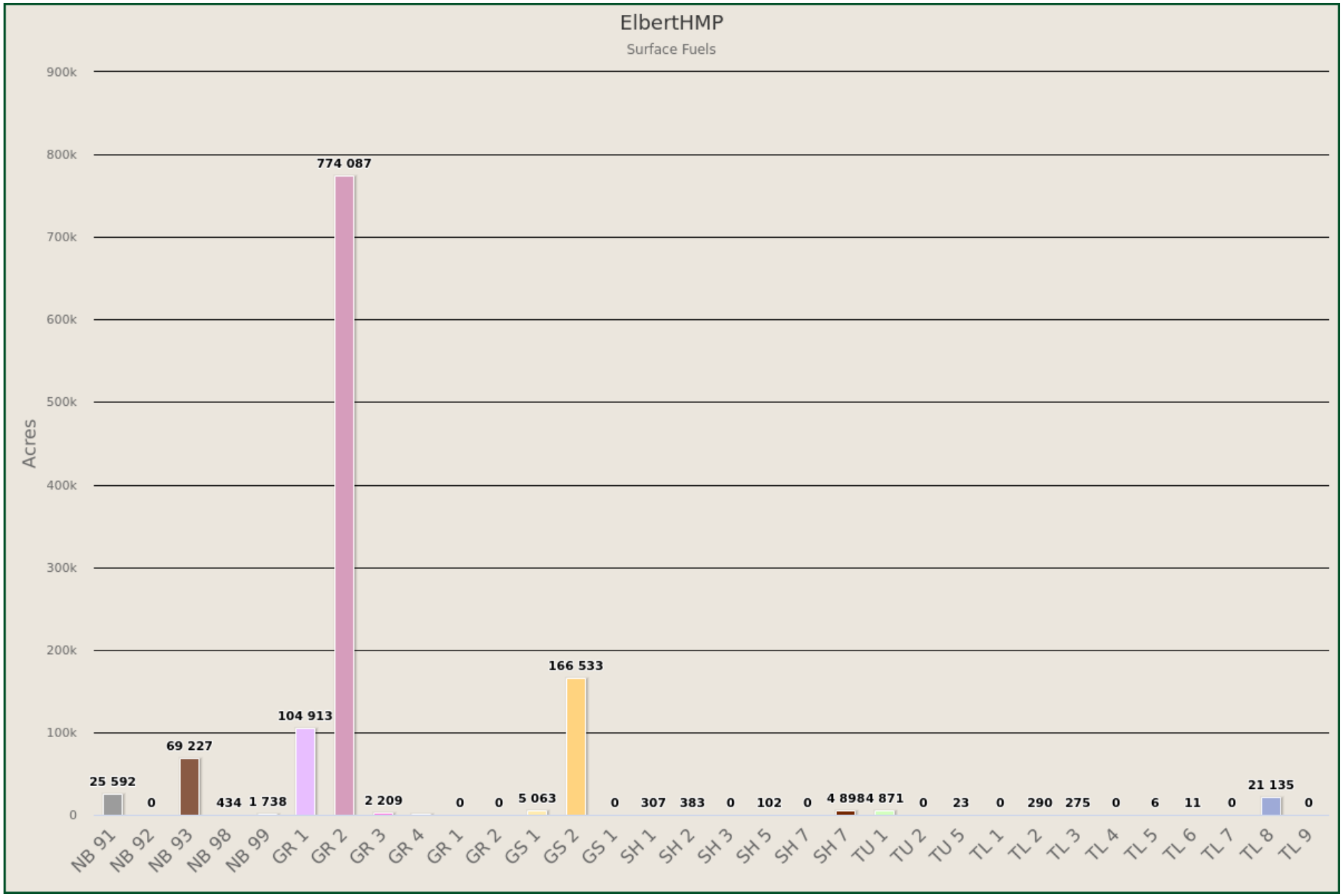


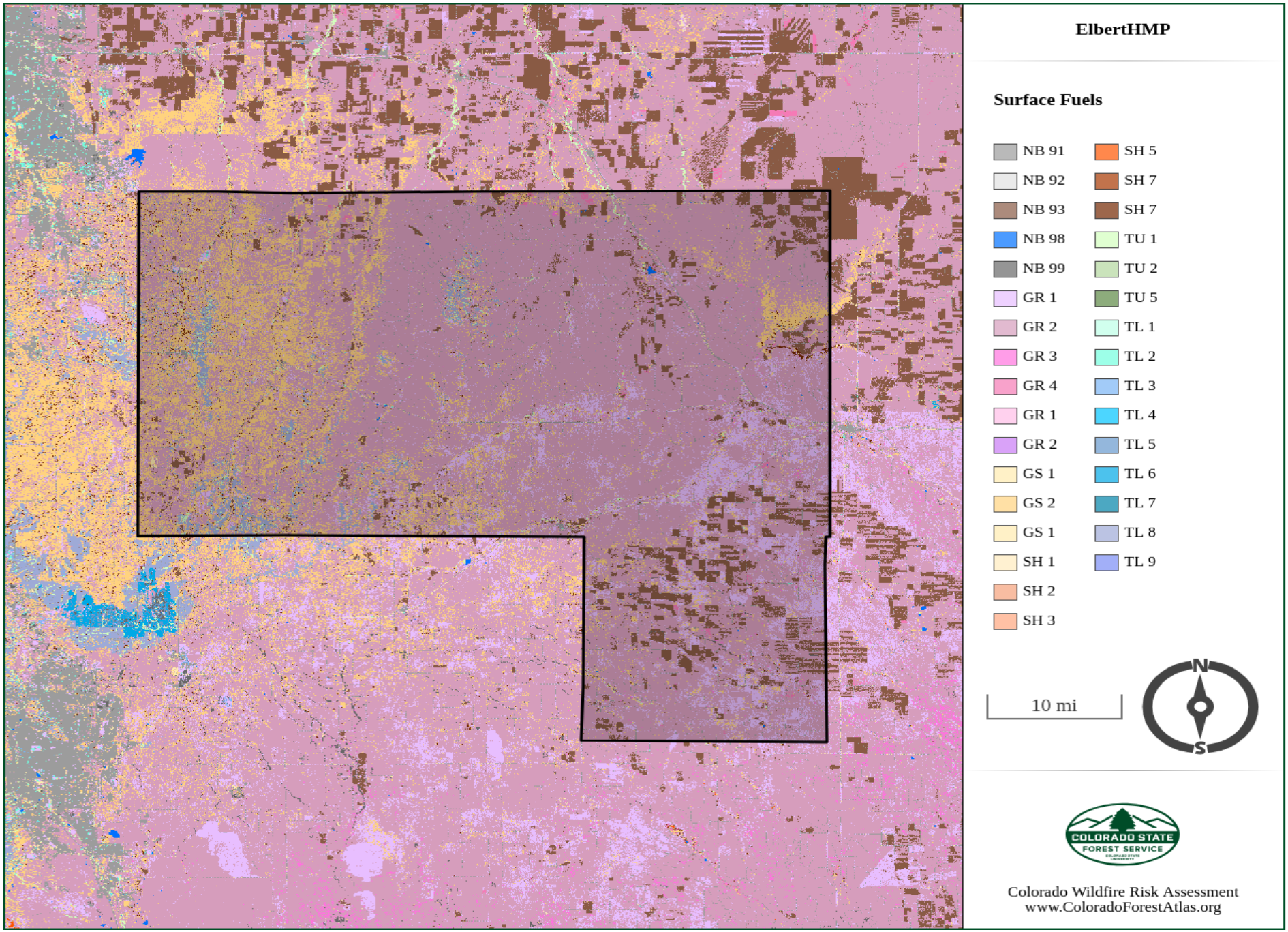
Slash on the ground indicates that forest management treatments have occurred in this area

The 2017 Colorado Surface Fuels were derived by enhancing the baseline LANDFIRE 2014 products with modifications to reflect local conditions and knowledge. A team of fuels and fire behavior experts, led by the CSFS, conducted a detailed calibration of the LANDFIRE 2014 fuels datasets. This calibration involved correcting LANDFIRE mapping zone seamlines errors; adding recent disturbances from 2013 to 2017 for fires, insect and disease, and treatments; correcting fuels for high elevations; adjusting fuels for oak-shrublands and pinyon-juniper areas; and modifying SH7 fuel designations. This calibration effort resulted in an accurate and up-to-date surface fuels dataset that is the basis for the fire behavior and risk calculations in the 2017 Colorado Wildfire Risk Assessment Update.

A detailed description of the fuels calibration methods and results is provided in the CSFS 2017 Fuels Calibration Final Report (July 2018).

Surface Fuels	Description	Acres	Percent
NB 91	Urban/Developed	25,592	2.2 %
NB 92	Snow/Ice	0	0 %
NB 93	Agriculture	69,227	5.8 %
NB 98	Water	434	0.0 %
NB 99	Barren	1,738	0.1 %
GR 1	Short, sparse, dry climate grass	104,913	8.9 %
GR 2	Low load, dry climate grass	774,087	65.4 %
GR 3	Low load, very coarse, humid climate grass	2,209	0.2 %
GR 4	Moderate load, dry climate grass	1,819	0.2 %
GR 1	GT 10,000 ft elevation	0	0 %
GR 2	GT 10,000 ft elevation	0	0 %
GS 1	Low load, dry climate grass-shrub	5,063	0.4 %
GS 2	Moderate load, dry climate grass-shrub	166,533	14.1 %
GS 1	GT 10,000 ft elevation	0	0 %
SH 1	Low load, dry climate shrub	307	0.0 %
SH 2	Moderate load, dry climate shrub	383	0.0 %
SH 3	Moderate load, humid climate shrub	0	0 %
SH 5	High load, humid climate shrub	102	0.0 %
SH 7	Very high load, dry climate shrub	0	0.0 %
SH 7	Oak Shrubland without changes	4,898	0.4 %
TU 1	Light load, dry climate timber-grass-shrub	4,871	0.4 %
TU 2	Moderate load, humid climate timber-shrub	0	0 %
TU 5	Very high load, dry climate timber-shrub	23	0.0 %
TL 1	Low load, compact conifer litter	0	0 %
TL 2	Low load, broadleaf litter	290	0.0 %
TL 3	Moderate load, conifer litter	275	0.0 %
TL 4	Small downed logs	0	0 %
TL 5	High load, conifer litter	6	0.0 %
TL 6	Moderate load, broadleaf litter	11	0.0 %
TL 7	Large downed logs	0	0 %
TL 8	Long-needle litter	21,135	1.8 %
TL 9	Very high load, broadleaf litter	0	0 %
Total		**1,183,916**	**100 %**


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Surface Fuels
Acres
900k
800k
700k
600k
500k
400k
300k
200k
100k
0
25 592
0
69 227
434
1 738
104 913
774 087
2 209
0
0
5 063
166 533
0
307
383
0
102
0
4 898
4 871
0
23
0
290
275
0
6
11
0
21 135
0
NB 91
NB 92
NB 93
NB 98
NB 99
GR 1
GR 2
GR 3
GR 4
GR 1
GR 2
GS 1
GS 2
GS 1
SH 1
SH 2
SH 3
SH 5
SH 7
SH 7
TU 1
TU 2
TU 5
TL 1
TL 2
TL 3
TL 4
TL 5
TL 6
TL 7
TL 8
TL 9


ElbertHMP
Surface Fuels
NB 91
NB 92
NB 93
NB 98
NB 99
GR 1
GR 2
GR 3
GR 4
GR 1
GR 2
GS 1
GS 2
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SH 1
SH 2
SH 3
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Vegetation

Description

The Vegetation map describes the general vegetation and landcover types across the state of Colorado. In the Colorado WRA, the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Canopy Bulk Density datasets.

The LANDFIRE 2014 version of data products (Existing Vegetation Type) was used to compile the Vegetation data for the Colorado WRA. This reflects data current to 2014. The LANDFIRE EVT data were classified to reflect general vegetation cover types for representation with CO-WRAP.



Oak shrublands are commonly found along dry foothills and lower mountain slopes, and are often situated above Piñyon-juniper.



Piñyon-juniper woodlands are common in southern and southwestern Colorado.



Douglas-fir understory in a ponderosa pine forest.



Grasslands occur both on Colorado's Eastern Plains and on the Western Slope.

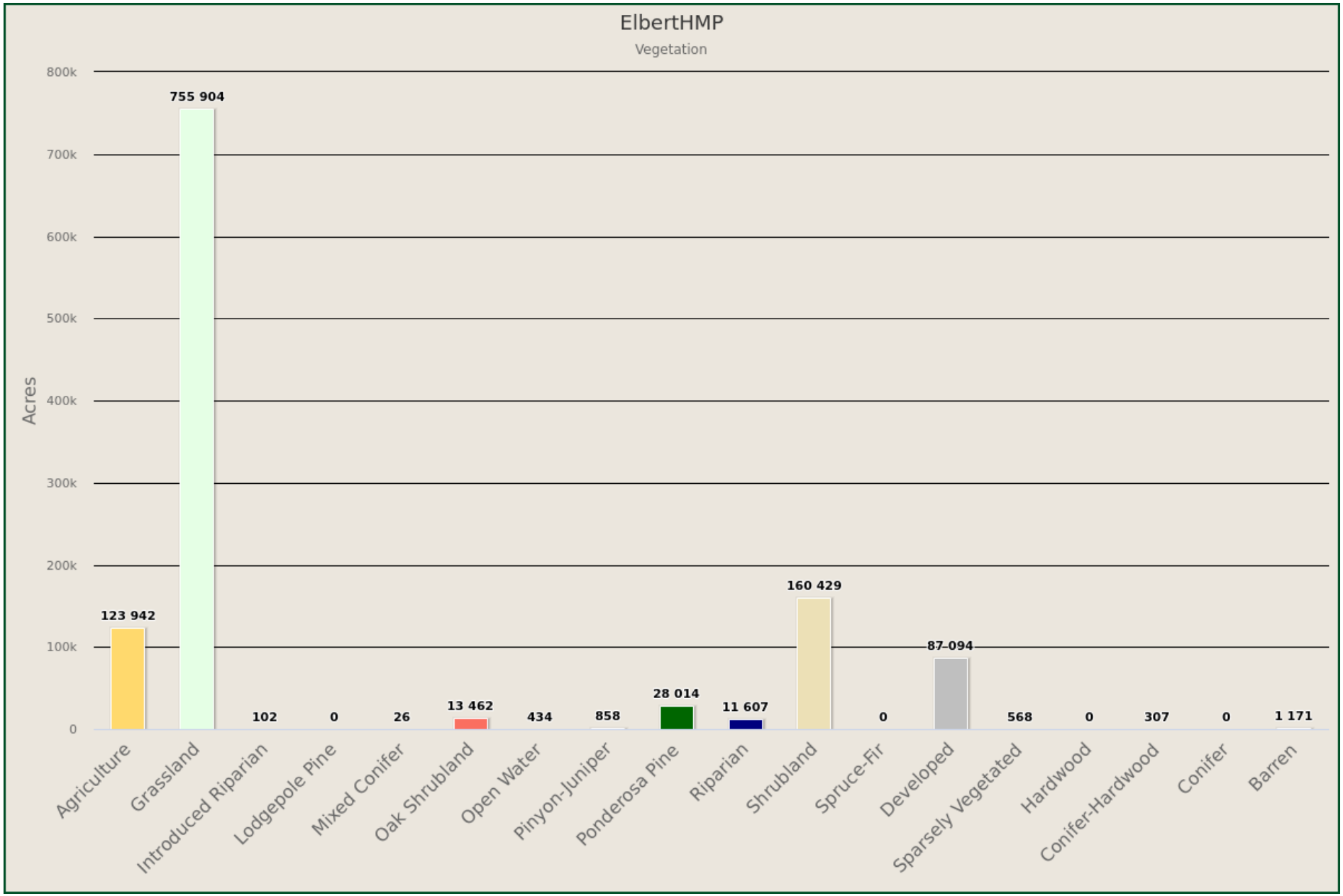


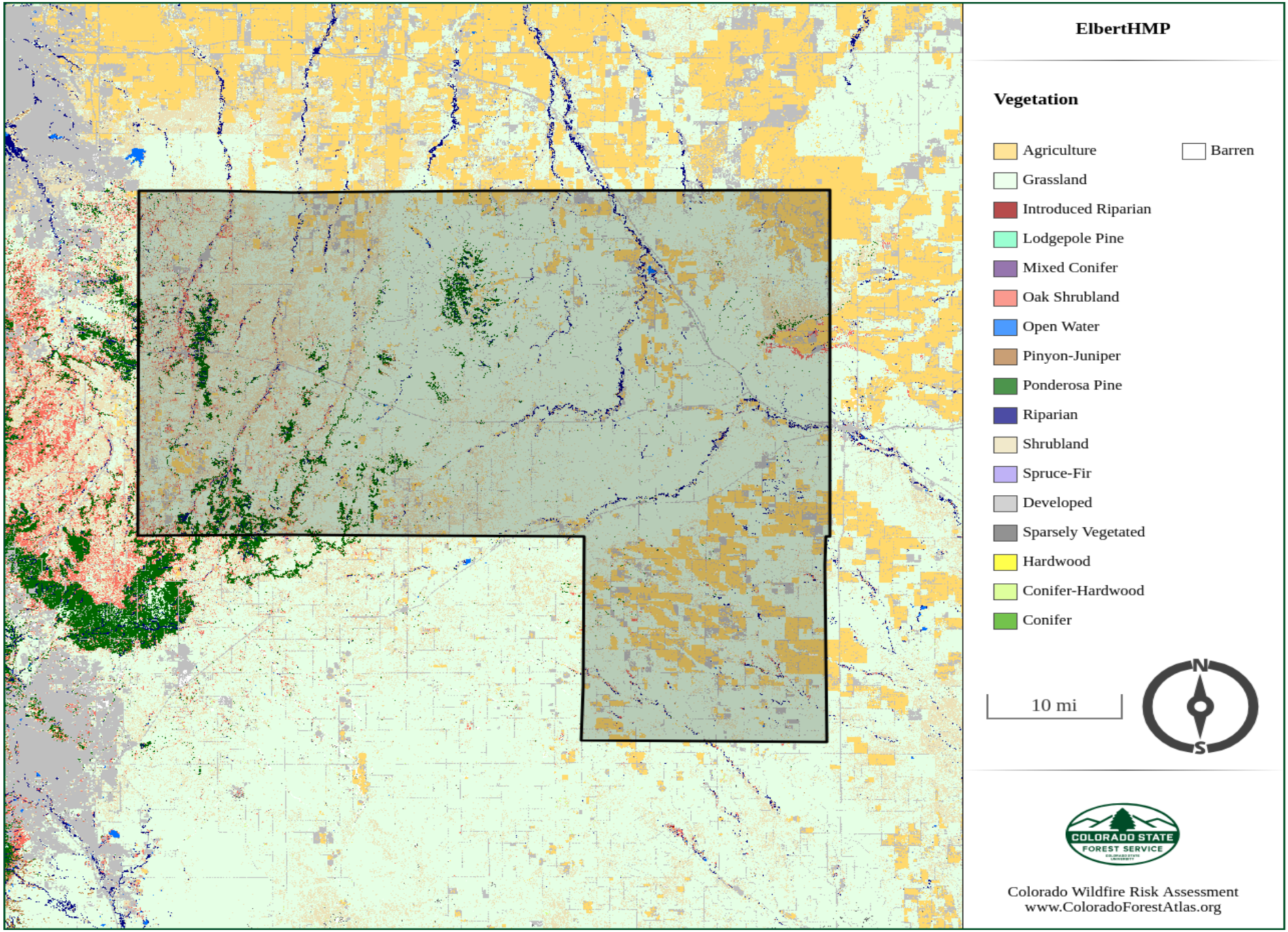
Wildland fire threat increases in lodgepole pine as the dense forests grow old.



Overly dense ponderosa pine, a dominant species of the montane zone.

Vegetation Class	Acres	Percent
Agriculture	123,942	10.5 %
Grassland	755,904	63.8 %
Introduced Riparian	102	0.0 %
Lodgepole Pine	0	0 %
Mixed Conifer	26	0.0 %
Oak Shrubland	13,462	1.1 %
Open Water	434	0.0 %
Pinyon-Juniper	858	0.1 %
Ponderosa Pine	28,014	2.4 %
Riparian	11,607	1.0 %
Shrubland	160,429	13.6 %
Spruce-Fir	0	0 %
Developed	87,094	7.4 %
Sparsely Vegetated	568	0.0 %
Hardwood	0	0 %
Conifer-Hardwood	307	0.0 %
Conifer	0	0 %
Barren	1,171	0.1 %
Total	**1,183,916**	**100 %**


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Vegetation
Acres
800k
700k
600k
500k
400k
300k
200k
100k
0
123 942
755 904
102
0
26
13 462
434
858
28 014
11 607
160 429
0
87 094
568
0
307
0
1 171
Agriculture
Grassland
Introduced Riparian
Lodgepole Pine
Mixed Conifer
Oak Shrubland
Open Water
Pinyon-Juniper
Ponderosa Pine
Riparian
Shrubland
Spruce-Fir
Developed
Sparsely Vegetated
Hardwood
Conifer-Hardwood
Conifer
Barren


ElbertHMP
Vegetation
Agriculture
Barren
Grassland
Introduced Riparian
Lodgepole Pine
Mixed Conifer
Oak Shrubland
Open Water
Pinyon-Juniper
Ponderosa Pine
Riparian
Shrubland
Spruce-Fir
Developed
Sparsely Vegetated
Hardwood
Conifer-Hardwood
Conifer
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Drinking Water Importance Areas

Description

Drinking Water Importance Areas is the measure of quality and quantity of public surface drinking water categorized by watershed. This layer identifies an index of surface drinking water importance, reflecting a measure of water quality and quantity, characterized by Hydrologic Unit Code 12 (HUC 12) watersheds. The Hydrologic Unit system is a standardized watershed classification system developed by the USGS. Areas that are a source of drinking water are of critical importance and adverse effects from fire are a key concern.

The U.S. Forest Service Forests to Faucets (F2F) project is the primary source of the drinking water data set. This project used GIS modeling to develop an index of importance for supplying drinking water using HUC 12 watersheds as the spatial resolution. Watersheds are ranked from 1 to 100 reflecting relative level of importance, with 100 being the most important and 1 the least important.

Several criteria were used in the F2F project to derive the importance rating including water supply, flow analysis, and downstream drinking water demand. The final model of surface drinking water importance used in the F2F project combines the drinking water protection model, capturing the flow of water and water demand, with a model of mean annual water supply.

The values generated by the drinking water protection model are simply multiplied by the results of the model of mean annual water supply to create the final surface drinking water importance index.

Water is critical to sustain life. Human water usage has further complicated nature's already complex aquatic system. Plants, including trees, are essential to the proper functioning of water movement within the environment. Forests receive precipitation, utilize it for their sustenance and growth, and influence its storage and/or passage to other parts of the environment.

Four major river systems – the Platte, Colorado, Arkansas and Rio Grande – originate in the Colorado mountains and fully drain into one-third of the landmass of the lower 48 states. Mountain snows supply 75 percent of the water to these river systems.



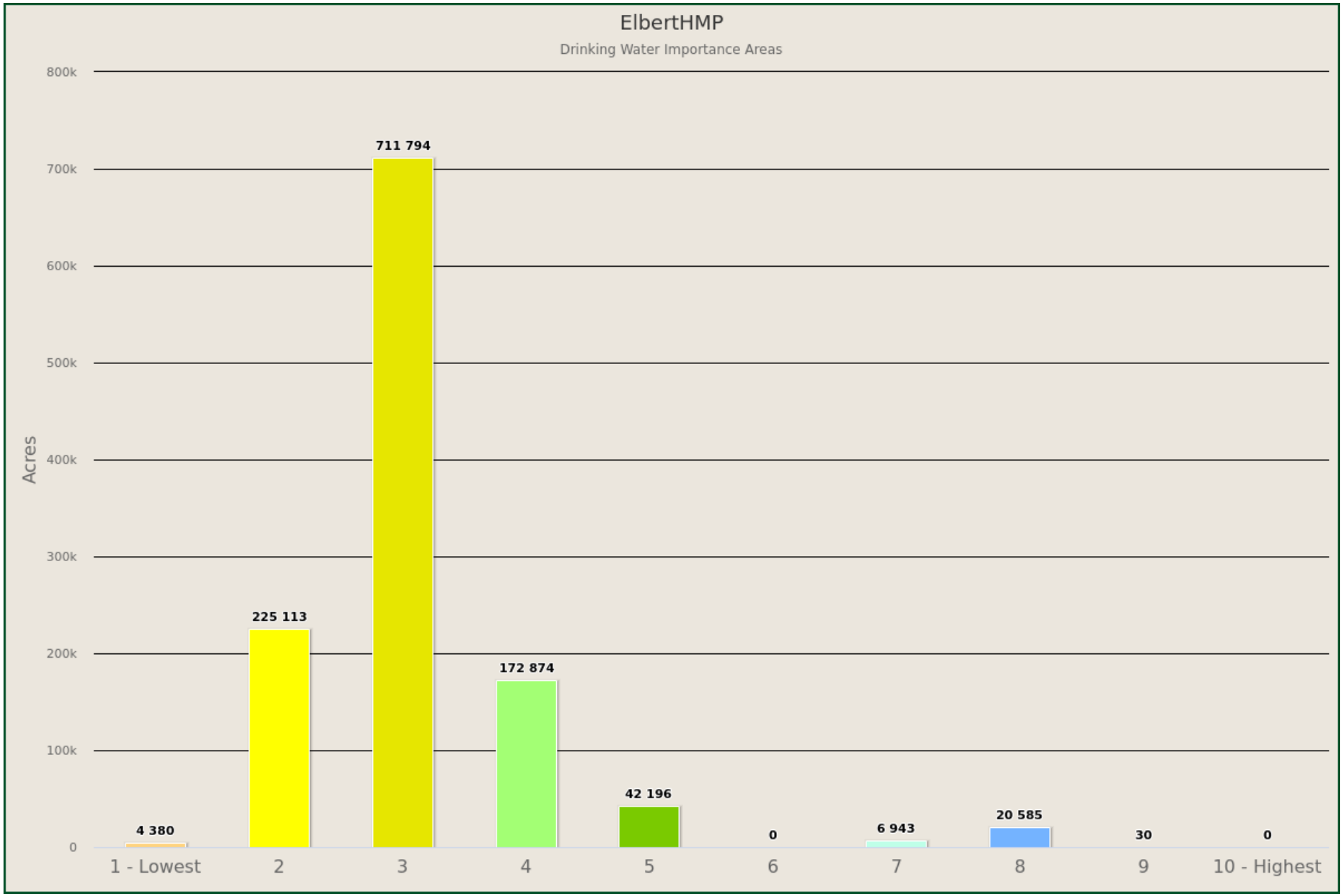
Virtually all of Colorado's drinking water comes from snowmelt carried at some point by a river.

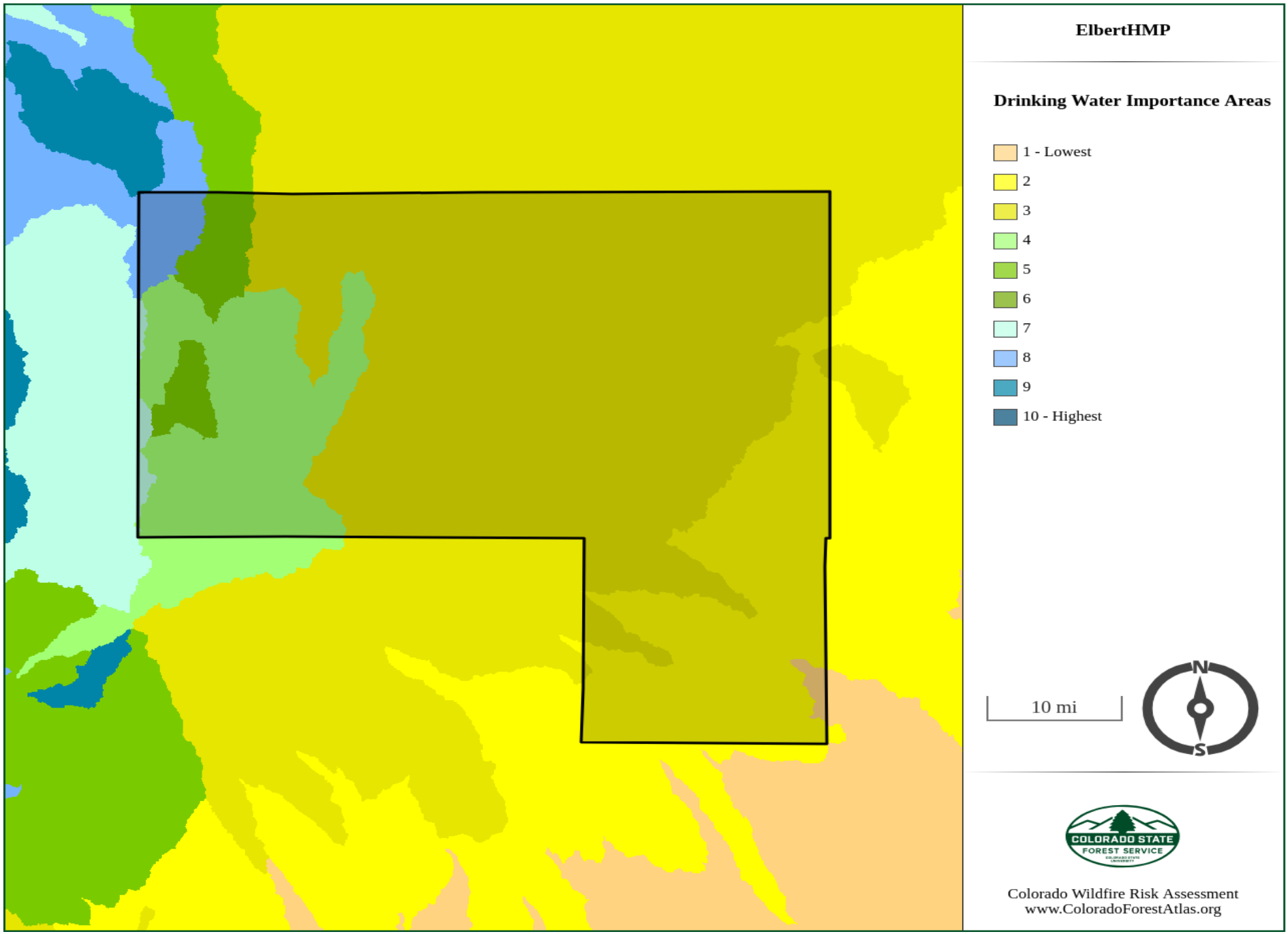


The headwaters of the Animas River begin near Silverton, CO at elevations greater than 12,000 feet.

Approximately 40 percent of the water comes from the highest 20 percent of the land, most of which lies in national forests. National forests yield large portions of the total water in these river systems. The potential is great for forests to positively and negatively influence the transport of water over such immense distances.

Drinking Water Class	Acres	Percent
1 - Lowest	4,380	0.4 %
2	225,113	19.0 %
3	711,794	60.1 %
4	172,874	14.6 %
5	42,196	3.6 %
6	0	0 %
7	6,943	0.6 %
8	20,585	1.7 %
9	30	0.0 %
10 - Highest	0	0 %
Total	**1,183,916**	**100 %**


ElbertHMP
Drinking Water Importance Areas
Acres
800k
700k
600k
500k
400k
300k
200k
100k
0
4 380
225 113
711 794
172 874
42 196
0
6 943
20 585
30
0
1 - Lowest
2
3
4
5
6
7
8
9
10 - Highest


ElbertHMP
Drinking Water Importance Areas
1 - Lowest
2
3
4
5
6
7
8
9
10 - Highest
10 mi
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Drinking Water Risk Index

Description

Drinking Water Risk Index is a measure of the risk to DWIAs based on the potential negative impacts from wildfire.

In areas that experience low-severity burns, fire events can serve to eliminate competition, rejuvenate growth and improve watershed conditions. But in landscapes subjected to high, or even moderate-burn severity, the post-fire threats to public safety and natural resources can be extreme.

High-severity wildfires remove virtually all forest vegetation – from trees, shrubs and grasses down to discarded needles, decomposed roots and other elements of ground cover or duff that protect forest soils. A severe wildfire also can cause certain types of soil to become hydrophobic by forming a waxy, water-repellent layer that keeps water from penetrating the soil, dramatically amplifying the rate of runoff.

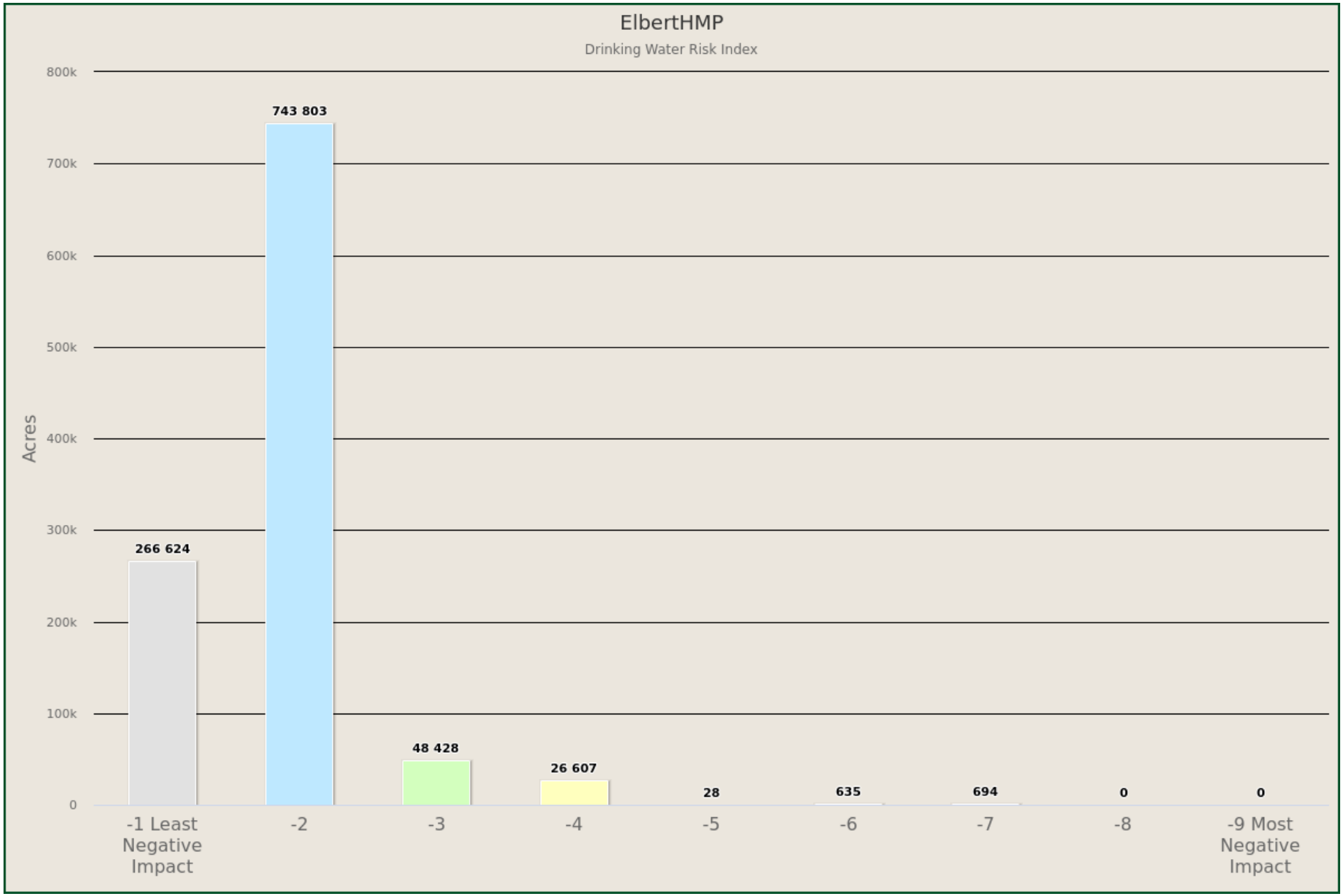
The loss of critical surface vegetation leaves forested slopes extremely vulnerable to large-scale soil erosion and flooding during subsequent storm events. In turn, these threats can impact the health, safety and integrity of communities and natural resources downstream. The likelihood that such a post-fire event will occur in Colorado is increased by the prevalence of highly erodible soils in several parts of the state, and weather patterns that frequently bring heavy rains on the heels of fire season.

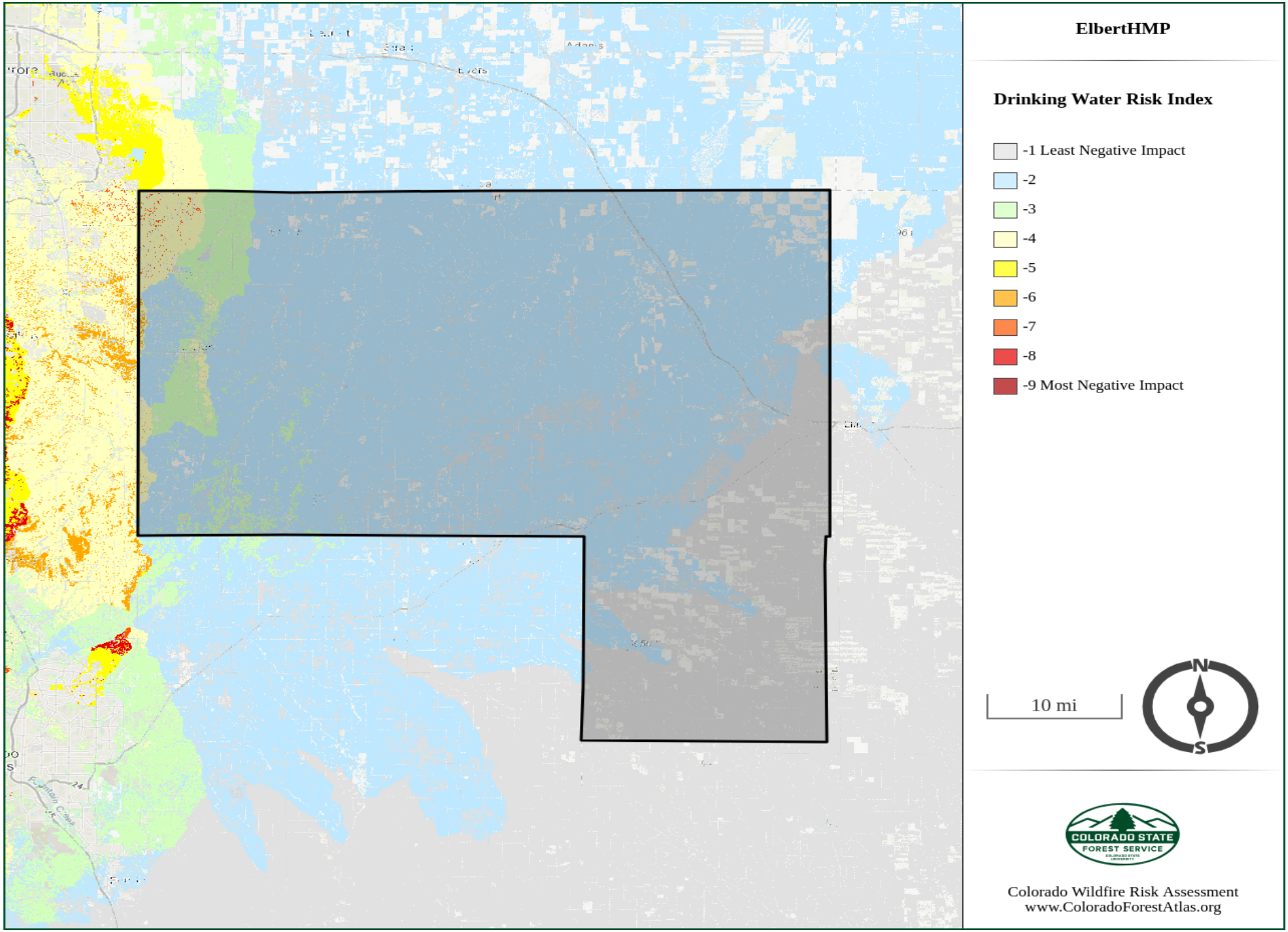
In the aftermath of the 2002 fire season, the Colorado Department of Health estimated that 26 municipal water storage facilities were shut down due to fire and post-fire impacts.

The potential for severe soil erosion is a consequence of wildfire because as a fire burns, it destroys plant material and the litter layer. Shrubs, forbs, grasses, trees and the litter layer disperse water during severe rainstorms. Plant roots stabilize the soil, and stems and leaves slow the water to give it time to percolate into the soil profile. Fire can destroy this soil protection.

The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact.

Class	Acres	Percent
-1 Least Negative Impact	266,624	24.5 %
-2	743,803	68.4 %
-3	48,428	4.5 %
-4	26,607	2.4 %
-5	28	0.0 %
-6	635	0.1 %
-7	694	0.1 %
-8	0	0 %
-9 Most Negative Impact	0	0 %
Total	**1,086,818**	**100 %**


ElbertHMP
Drinking Water Risk Index
Acres
800k
700k
600k
500k
400k
300k
200k
100k
0
266 624
743 803
48 428
26 607
28
635
694
0
0
-1 Least Negative Impact
-2
-3
-4
-5
-6
-7
-8
-9 Most Negative Impact


ElbertHMP
Drinking Water Risk Index
-1 Least Negative Impact
-2
-3
-4
-5
-6
-7
-8
-9 Most Negative Impact
10 mi
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Riparian Assets

Description

Riparian Assets are forested riparian areas characterized by functions of water quantity and quality, and ecology. This layer identifies riparian areas that are important as a suite of ecosystem services, including both terrestrial and aquatic habitat, water quality, water quantity, and other ecological functions. Riparian areas are considered an especially important element of the landscape in the west. Accordingly, riparian assets are distinguished from other forest assets so they can be evaluated separately.

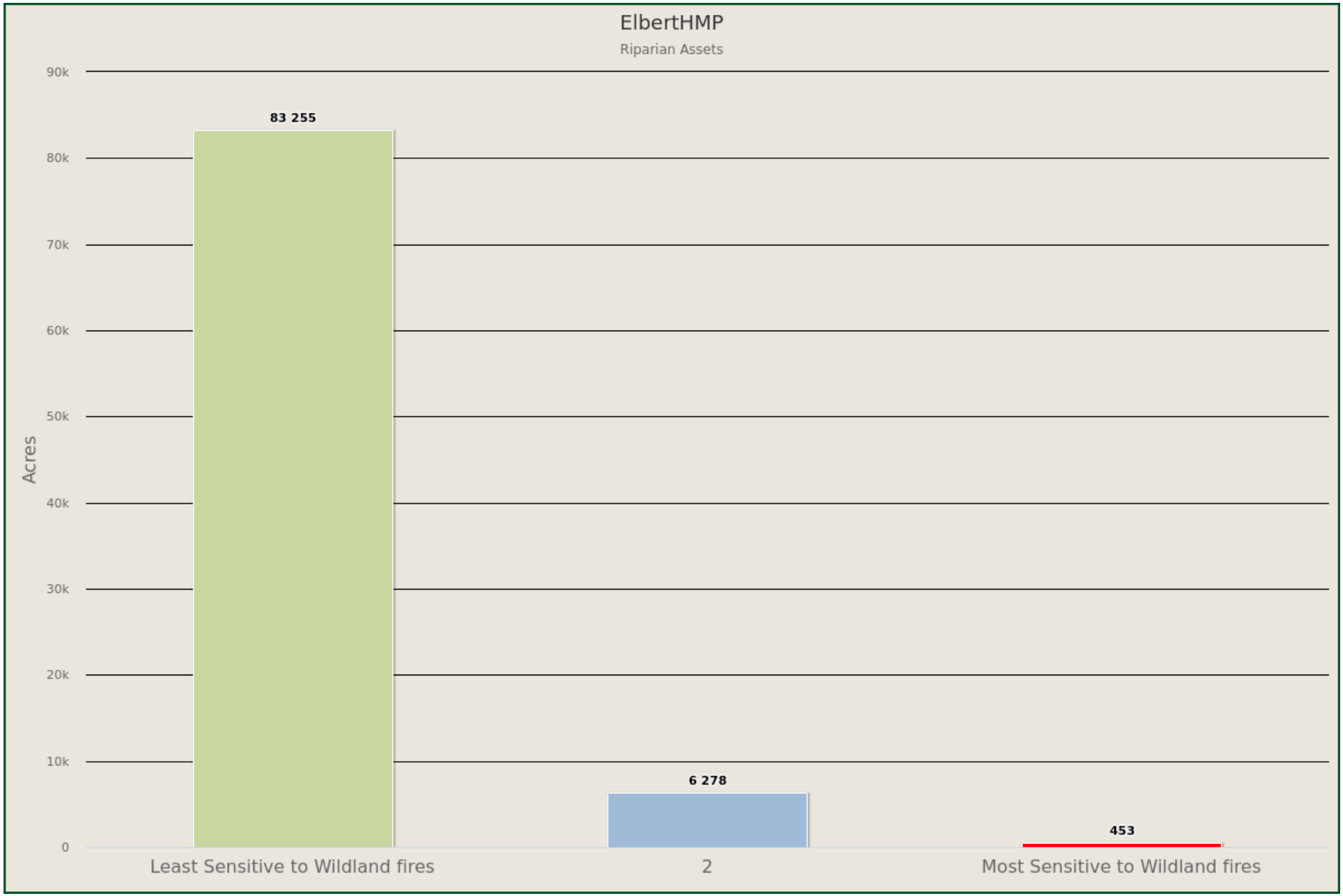
The process for defining these riparian areas involved identifying the riparian footprint and then assigning a rating based upon two important riparian functions – water quantity and quality, and ecological significance. A scientific model was developed by the West Wide Risk Assessment technical team with in-kind support from CAL FIRE state representatives. Several input datasets were used in the model including the National Hydrography Dataset and the National Wetland Inventory.

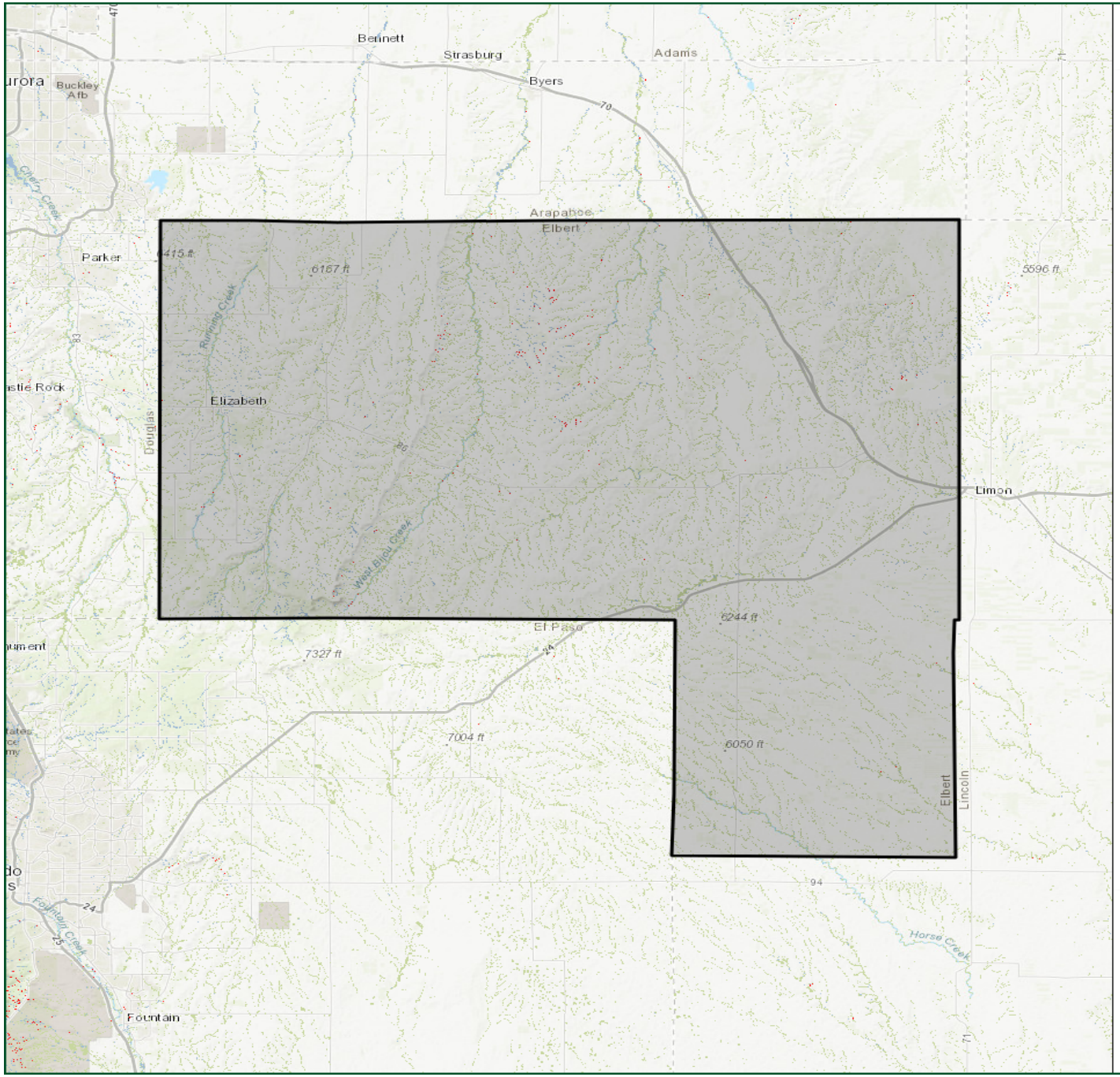


The National Hydrography Data Set (NHD) was used to represent hydrology. A subset of streams and water bodies, which represents perennial, intermittent, and wetlands, was created. The NHD water bodies dataset was used to determine the location of lakes, ponds, swamps, and marshes (wetlands).

To model water quality and quantity, erosion potential (K-factor) and annual average precipitation was used as key variables. The Riparian Assets data are an index of class values that range from 1 to 3 representing increasing importance of the riparian area as well as sensitivity to fire-related impacts on the suite of ecosystem services.

Riparian Assets Class	Acres	Percent
Least Sensitive to Wildland fires	83,255	92.5 %
2	6,278	7.0 %
Most Sensitive to Wildland fires	453	0.5 %
Total	**89,986**	**100 %**


ElbertHMP
Riparian Assets
90k
80k
70k
60k
50k
40k
30k
20k
10k
0
Acres
83 255
6 278
453
Least Sensitive to Wildland fires
2
Most Sensitive to Wildland fires



ElbertHMP

Riparian Assets

- Least Sensitive to Wildland fires
- 2
- Most Sensitive to Wildland fires

10 mi

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Riparian Assets Risk Index

Description

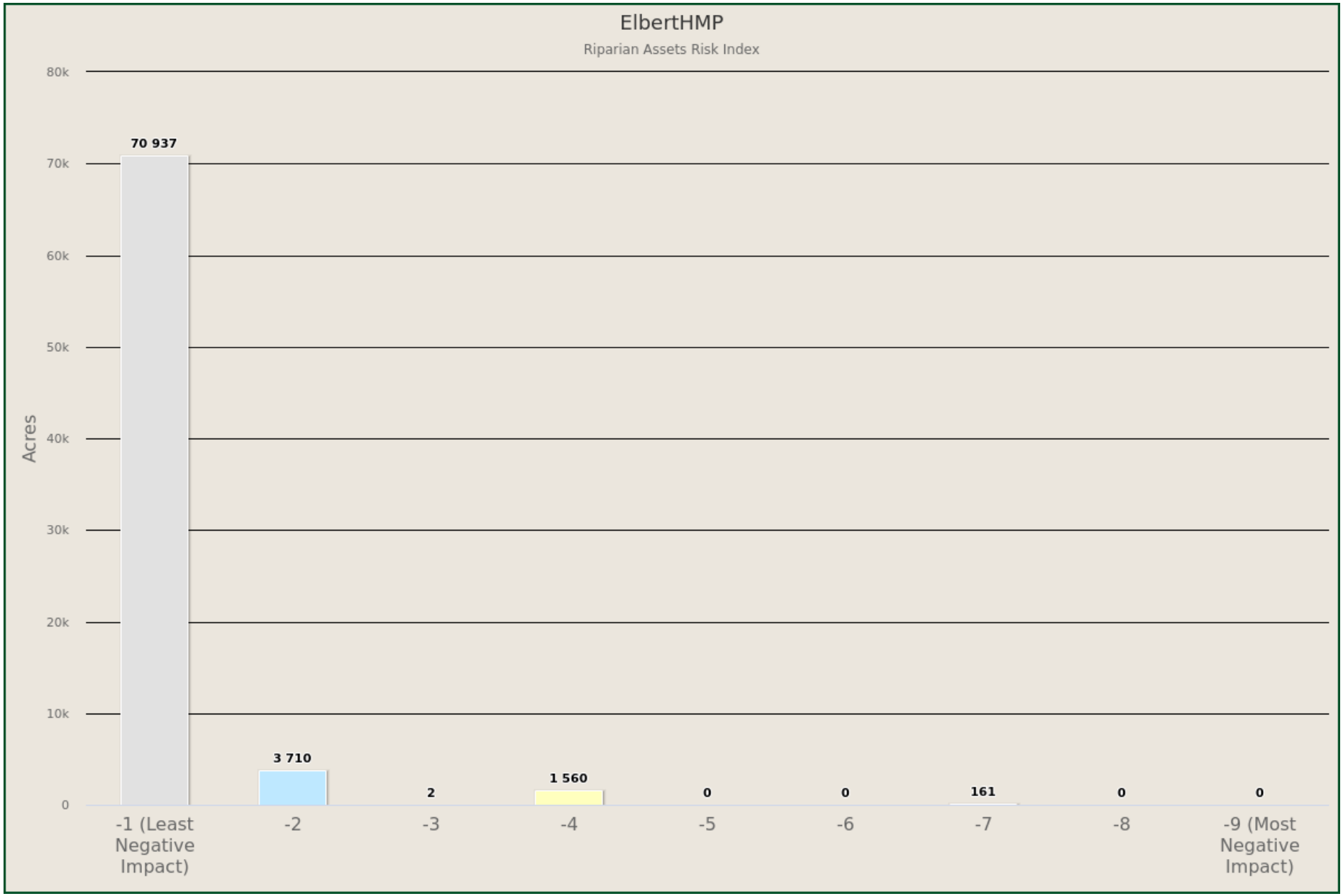
Riparian Assets Risk Index is a measure of the risk to riparian areas based on the potential negative impacts from wildfire. This layer identifies those riparian areas with the greatest potential for adverse effects from wildfire.

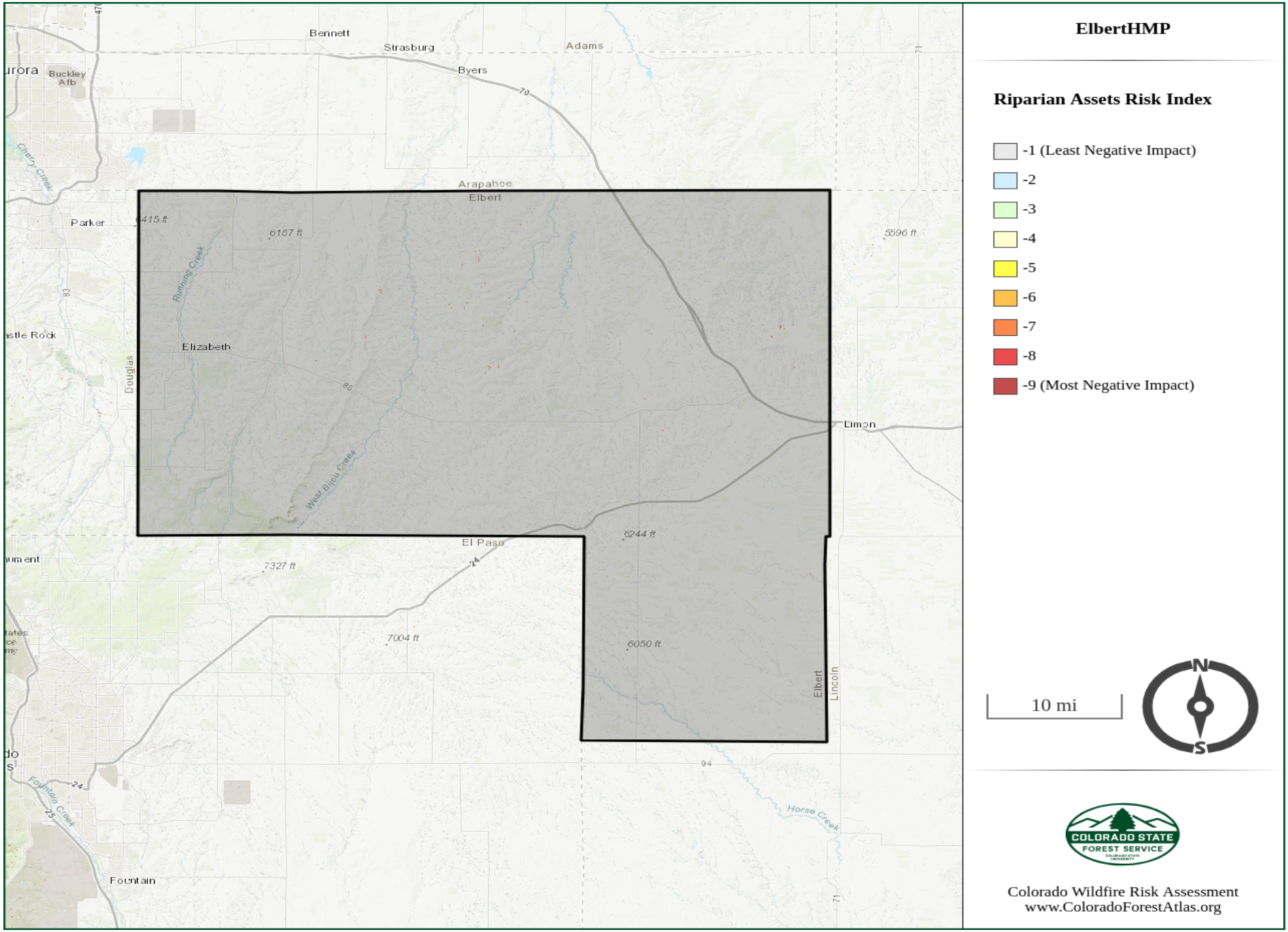
The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact.

The risk index has been calculated by combining the Riparian Assets data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and high importance for ecosystem services. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and a low importance for ecosystem services.

This risk output is intended to supplement the Drinking Water Risk Index by identifying wildfire risk within the more detailed riparian areas.

Riparian Assets Risk Class	Acres	Percent
-1 (Least Negative Impact)	70,937	92.9 %
-2	3,710	4.9 %
-3	2	0.0 %
-4	1,560	2.0 %
-5	0	0.0 %
-6	0	0 %
-7	161	0.2 %
-8	0	0 %
-9 (Most Negative Impact)	0	0 %
Total	**76,370**	**100 %**


ElbertHMP
Riparian Assets Risk Index
Acres
80k
70k
60k
50k
40k
30k
20k
10k
0
70 937
3 710
2
1 560
0
0
161
0
0
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)


ElbertHMP
Riparian Assets Risk Index
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)
Bennett
Strasburg
Adams
Byers
Buckley Afb
Parker
Arapahoe
Elbert
Elizabeth
Douglas
El Paso
Limon
Lincoln
Fountain
Running Creek
West Bijou Creek
Horse Creek
Fountain Creek
6187 ft
5596 ft
6244 ft
7327 ft
7004 ft
6050 ft
10 mi
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Forest Assets

Description

Forest Assets are forested areas categorized by height, cover, and susceptibility/response to fire. This layer identifies forested land categorized by height, cover and susceptibility or response to fire. Using these characteristics allows for the prioritization of landscapes reflecting forest assets that would be most adversely affected by fire. The rating of importance or value of the forest assets is relative to each state's interpretation of those characteristics considered most important for their landscapes.

Canopy cover from LANDFIRE 2014 was re-classified into two categories, open or sparse and closed. Areas classified as open or sparse have a canopy cover less than 60%. Areas classified as closed have a canopy cover greater than 60%.

Canopy height from LANDFIRE 2014 was re-classified into two categories, 0-10 meters and greater than 10 meters.

Response to fire was developed from the LANDFIRE 2014 existing vegetation type (EVT) dataset. There are over 1,000 existing vegetation types in the project area. Using a crosswalk defined by project ecologists, a classification of susceptibility and response to fire was defined and documented by fire ecologists into the three fire response classes.

These three classes are sensitive, resilient and adaptive.

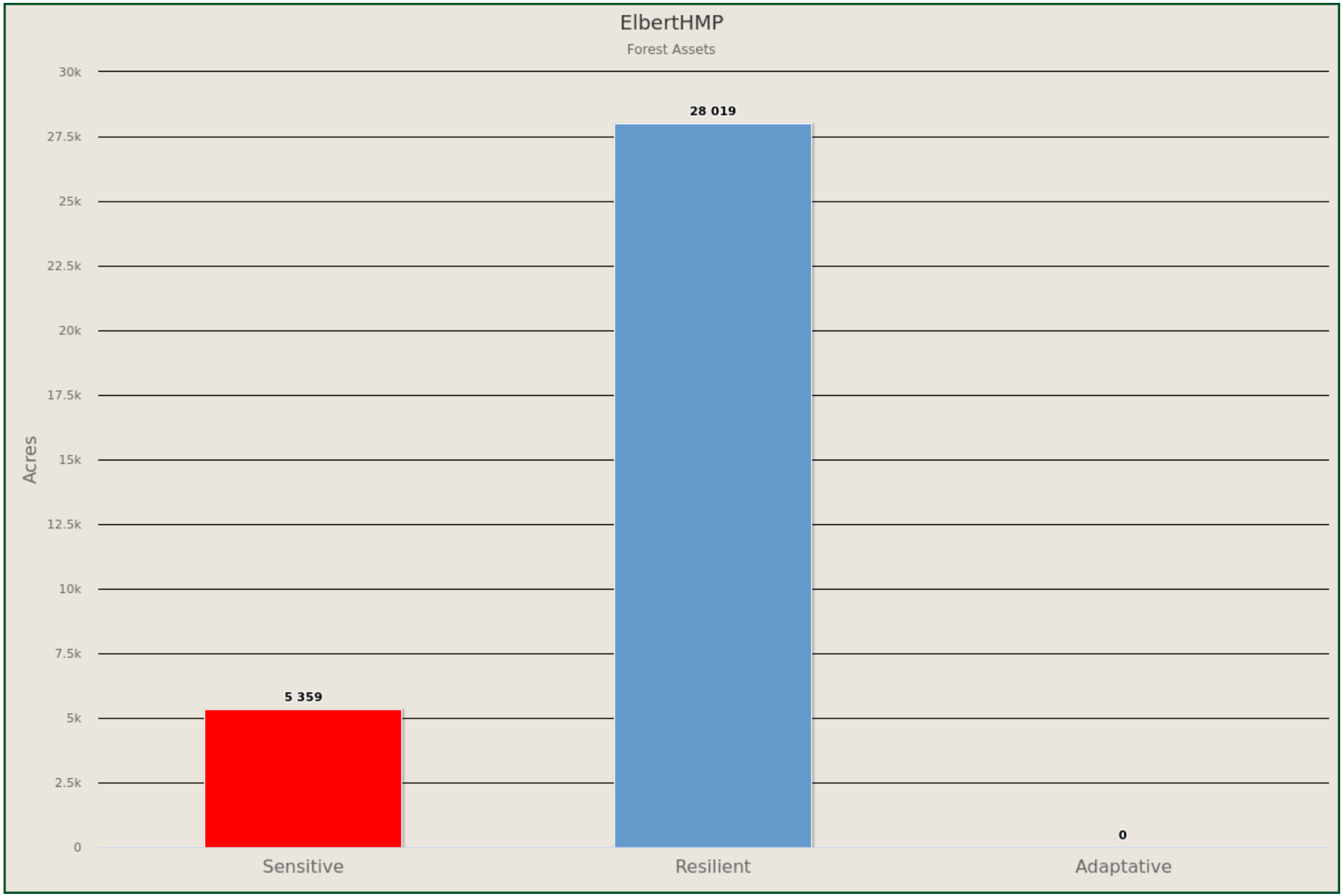
- **Sensitive** = These are tree species that are intolerant or sensitive to damage from fire with low intensity.
- **Resilient** = These are tree species that have characteristics that help the tree resist damage from fire and whose adult stages can survive low intensity fires.
- **Adaptive** = These are tree species adapted with the ability to regenerate following fire by sprouting or serotinous cones

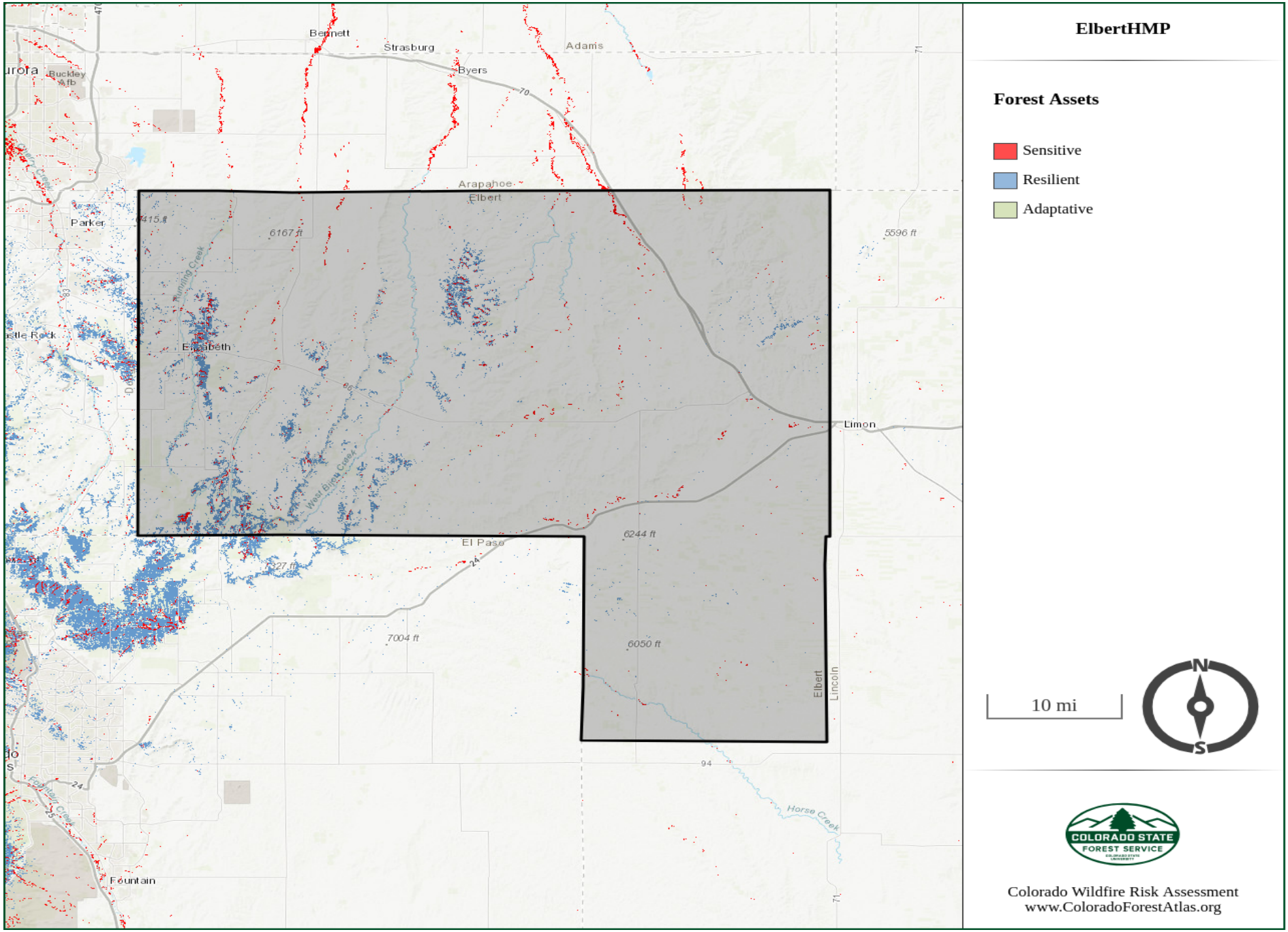
The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact.

The risk index has been calculated by combining the Forest Assets data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and low resilience or adaptability to fire. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and high resilience or adaptability to fire.

This risk output is intended to provide an overall forest index for potential impact from wildfire. This can be applied to consider aesthetic values, ecosystem services, or economic values of forested lands.

Forest Assets	Acres	Percent
Sensitive	5,359	16.1 %
Resilient	28,019	83.9 %
Adaptative	0	0 %
Total	**33,377**	**100 %**


ElbertHMP
Forest Assets
Acres
30k
27.5k
25k
22.5k
20k
17.5k
15k
12.5k
10k
7.5k
5k
2.5k
0
5 359
28 019
0
Sensitive
Resilient
Adaptative


ElbertHMP
Forest Assets
Sensitive
Resilient
Adaptative
Bennett
Strasburg
Adams
Byers
Buckley
AFB
Arapahoe
Elbert
Parker
6167 ft
5596 ft
Limon
El Paso
6244 ft
7004 ft
6050 ft
Elbert
Lincoln
Fountain
Horse Creek
10 mi
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Forest Assets Risk Index

Description

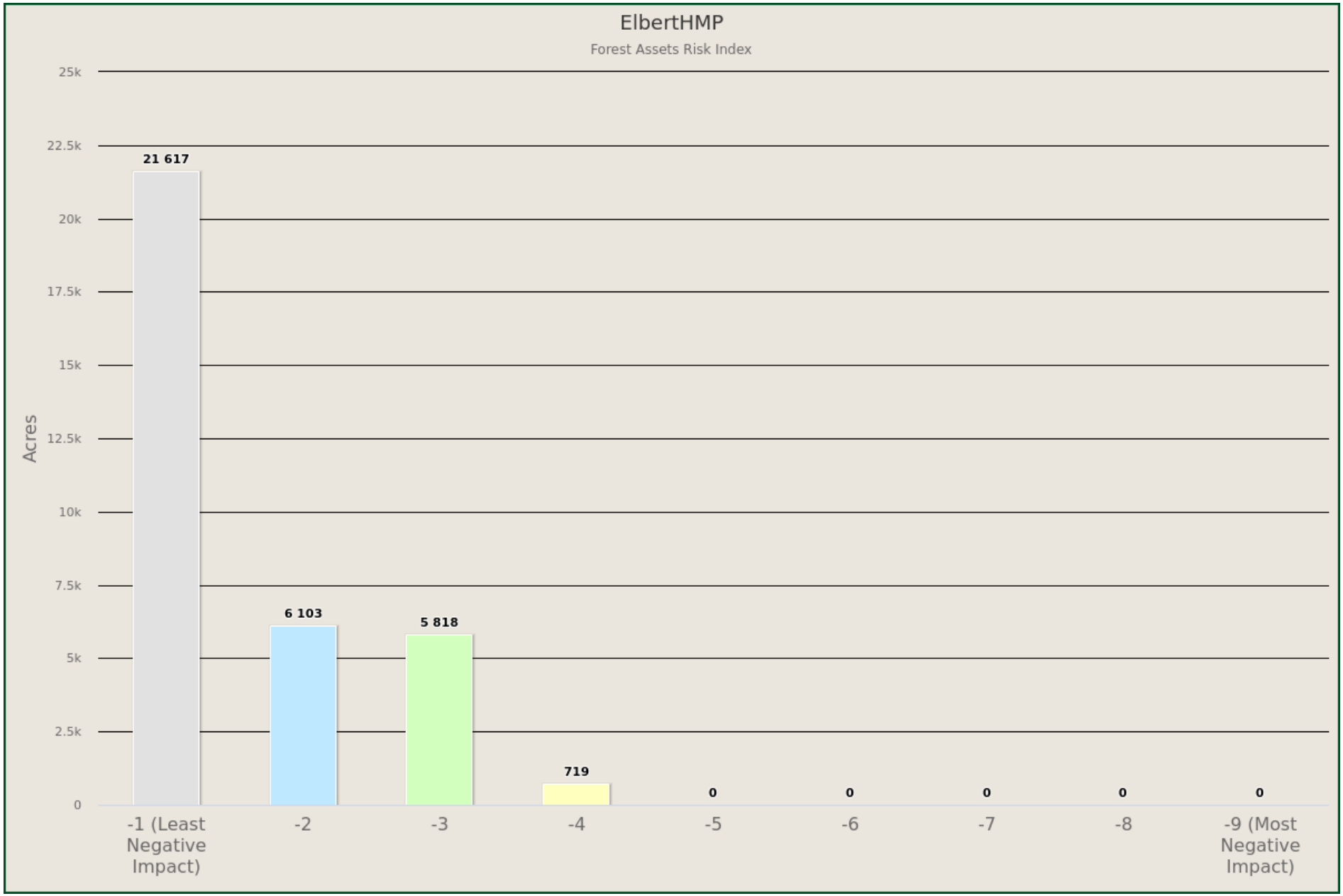
Forest Assets Risk Index is a measure of the risk to forested areas based on the potential negative impacts from wildfire. This layer identifies those forested areas with the greatest potential for adverse effects from wildfire.

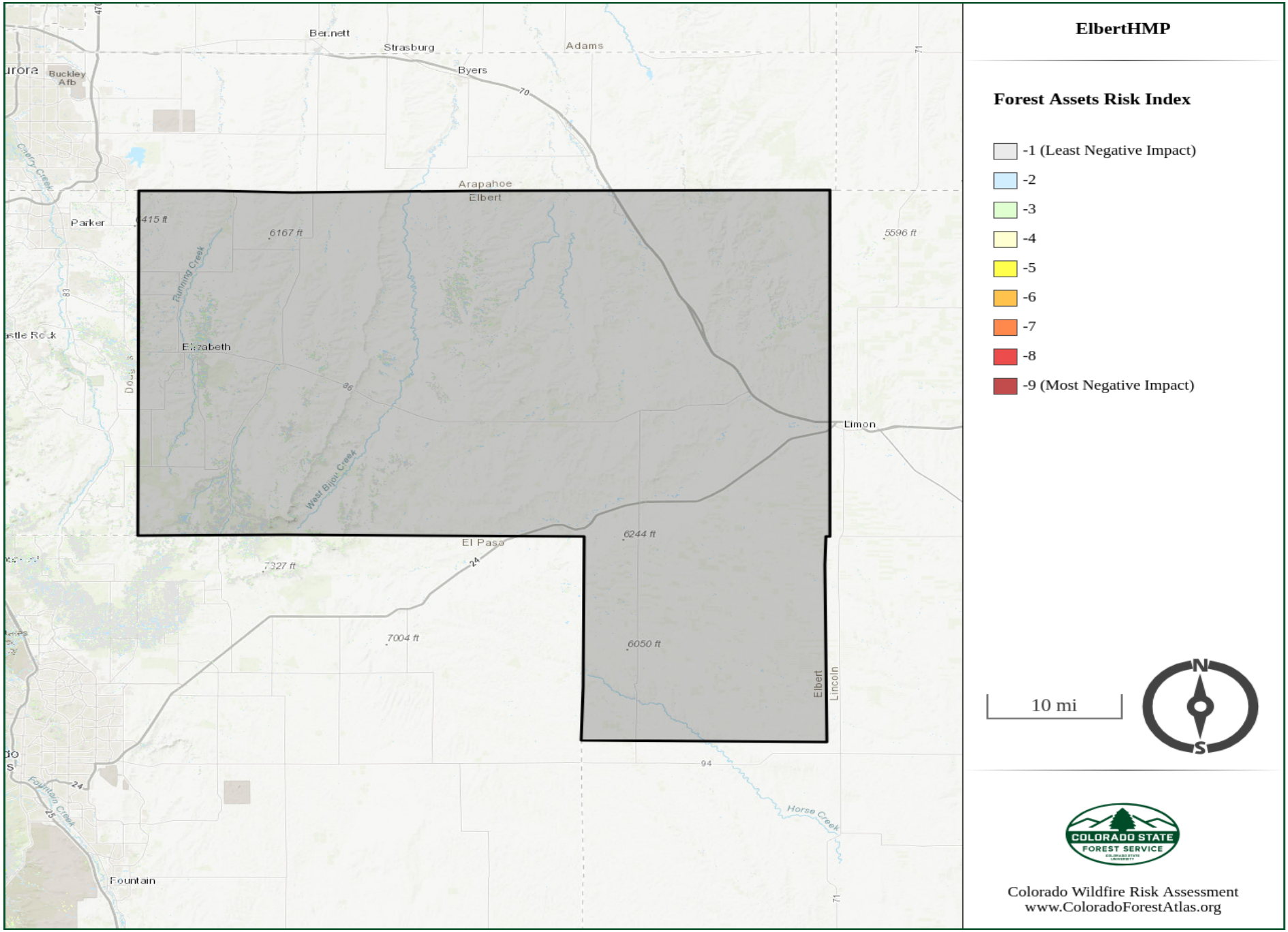
The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact.

The risk index has been calculated by combining the Forest Assets data with a measure of fire intensity using a Response Function approach. Those areas with the highest negative impact (-9) represent areas with high potential fire intensity and low resilience or adaptability to fire. Those areas with the lowest negative impact (-1) represent those areas with low potential fire intensity and high resilience or adaptability to fire.

This risk output is intended to provide an overall forest index for potential impact from wildfire. This can be applied to consider aesthetic values, ecosystem services, or economic values of forested lands.

Forest Assets Risk Class	Acres	Percent
-1 (Least Negative Impact)	21,617	63.1 %
-2	6,103	17.8 %
-3	5,818	17.0 %
-4	719	2.1 %
-5	0	0.0 %
-6	0	0 %
-7	0	0 %
-8	0	0 %
-9 (Most Negative Impact)	0	0 %
Total	**34,258**	**100 %**


ElbertHMP
Forest Assets Risk Index
Acres
25k
22.5k
20k
17.5k
15k
12.5k
10k
7.5k
5k
2.5k
0
21 617
6 103
5 818
719
0
0
0
0
0
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)


ElbertHMP
Forest Assets Risk Index
-1 (Least Negative Impact)
-2
-3
-4
-5
-6
-7
-8
-9 (Most Negative Impact)
Bennett
Strasburg
Adams
Byers
Buckley Afb
Arapahoe
Elbert
Parker
Elizabeth
Limon
El Paso
Fountain
Lincoln
6167 ft
5596 ft
6244 ft
7327 ft
7004 ft
6050 ft
Running Creek
West Bijou Creek
Horse Creek
Fountain Creek
10 mi
N
S
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7 EARTHQUAKE HAZUS RISK REPORT

Hazus: Earthquake Global Risk Report

Region Name: ElbertEQ

Earthquake Scenario: 2500 m5 probabalistic

Print Date: July 05, 2022

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Colorado

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 1,850.52 square miles and contains 7 census tracts. There are over 8 thousand households in the region which has a total population of 23,086 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 2,640 (millions of dollars). Approximately 90.00 % of the buildings (and 85.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 953 and 1,042 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 2,640 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 67% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of beds. There are 17 schools, 13 fire stations, 4 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 4 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,995.00 (millions of dollars). This inventory includes over 99.42 miles of highways, 88 bridges, 5,972.62 miles of pipes.

Table 1: Transportation System Lifeline Inventory

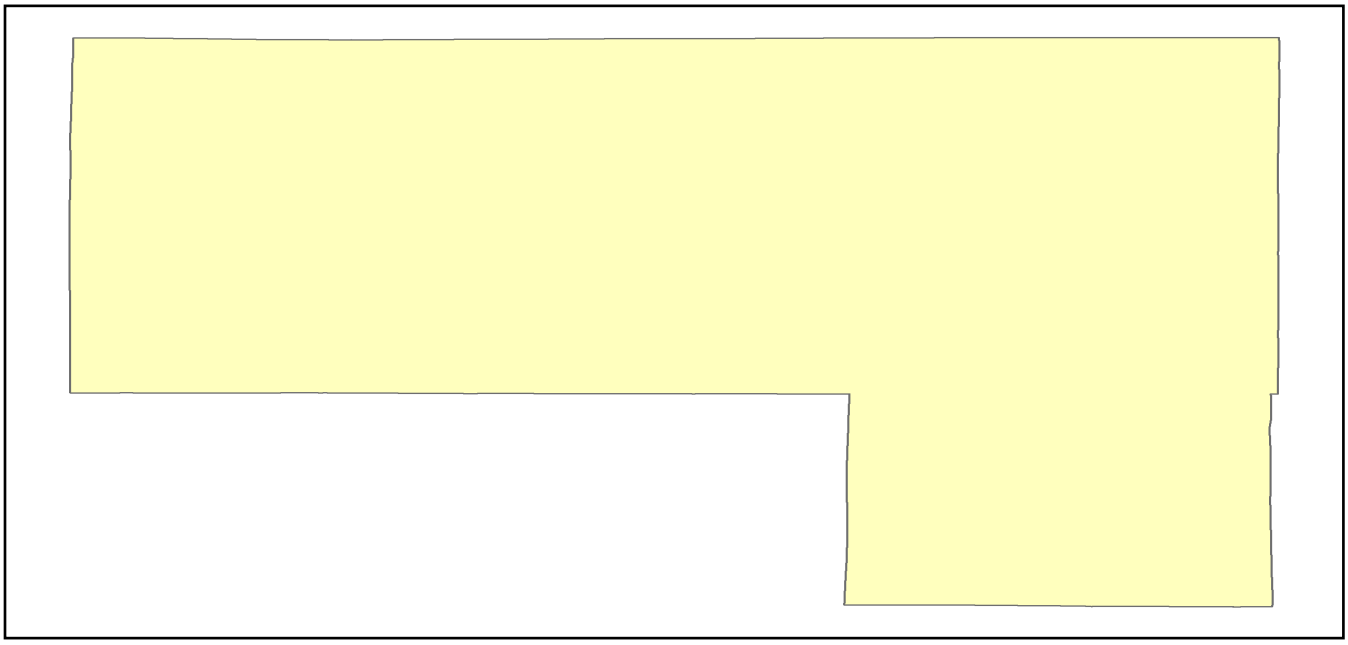
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	88	97.4009
	Segments	7	681.6301
	Tunnels	2	6.2656
		Subtotal	**785.2966**
Railways	Bridges	21	92.6132
	Facilities	0	0.0000
	Segments	12	66.5701
	Tunnels	0	0.0000
		Subtotal	**159.1833**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	2	8.8203
	Runways	0	0.0000
		Subtotal	**8.8203**
		Total	**953.30**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	119.1732
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**119.1732**
Waste Water	Distribution Lines	NA	71.5039
	Facilities	6	756.7828
	Pipelines	0	0.0000
		Subtotal	**828.2867**
Natural Gas	Distribution Lines	NA	47.6693
	Facilities	0	0.0000
	Pipelines	10	47.3639
		Subtotal	**95.0332**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	0	0.0000
		Subtotal	**0.0000**
Communication	Facilities	2	0.1940
		Subtotal	**0.1940**
		Total	**1,042.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	2500 m5 probabalistic
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	2,500.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 249 buildings will be at least moderately damaged. This is over 3.00 % of the buildings in the region. There are an estimated 1 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

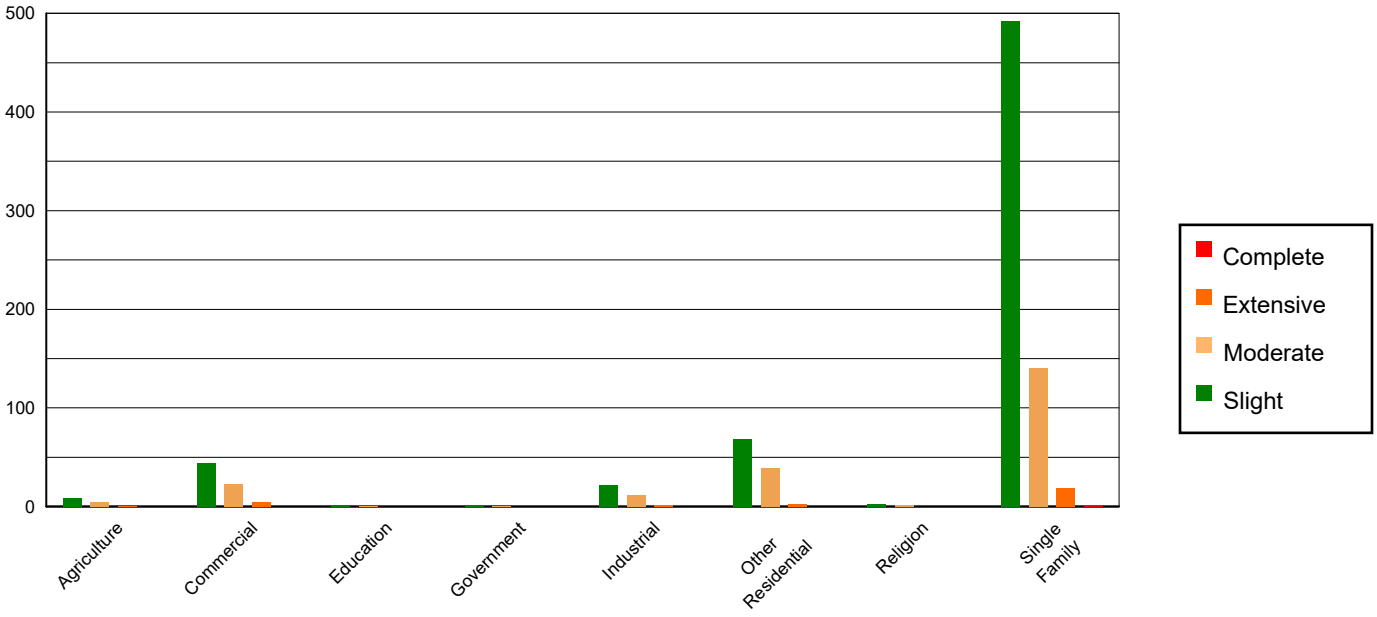


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	102.66	1.15	8.36	1.31	4.22	1.92	0.75	2.58	0.02	2.07
Commercial	431.10	4.83	44.13	6.90	22.45	10.22	4.17	14.37	0.16	15.25
Education	20.45	0.23	1.64	0.26	0.78	0.36	0.12	0.41	0.00	0.41
Government	15.17	0.17	1.22	0.19	0.54	0.24	0.07	0.24	0.00	0.22
Industrial	206.95	2.32	21.41	3.35	11.46	5.22	2.13	7.34	0.05	4.83
Other Residential	405.40	4.54	68.40	10.69	38.78	17.65	2.38	8.22	0.04	3.98
Religion	36.58	0.41	2.91	0.46	1.32	0.60	0.18	0.64	0.01	0.67
Single Family	7708.04	86.35	491.83	76.86	140.16	63.80	19.20	66.20	0.77	72.57
Total	**8,926**		**640**		**220**		**29**		**1**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6198.63	69.44	373.14	58.31	51.60	23.49	2.30	7.94	0.00	0.00
Steel	161.94	1.81	14.31	2.24	8.54	3.89	1.34	4.62	0.04	3.42
Concrete	116.89	1.31	12.22	1.91	5.20	2.36	0.51	1.76	0.00	0.46
Precast	143.39	1.61	15.19	2.37	12.54	5.71	3.15	10.87	0.04	3.55
RM	1703.55	19.08	112.83	17.63	76.67	34.90	13.07	45.06	0.00	0.02
URM	240.48	2.69	45.70	7.14	26.45	12.04	6.34	21.86	0.94	89.06
MH	361.46	4.05	66.52	10.40	38.69	17.61	2.29	7.89	0.04	3.49
Total	**8,926**		**640**		**220**		**29**		**1**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had hospital beds available for use. On the day of the earthquake, the model estimates that only hospital beds (%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, % of the beds will be back in service. By 30 days, % will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	17	0	0	17
EOCs	1	0	0	1
PoliceStations	4	0	0	4
FireStations	13	0	0	13

Transportation Lifeline Damage

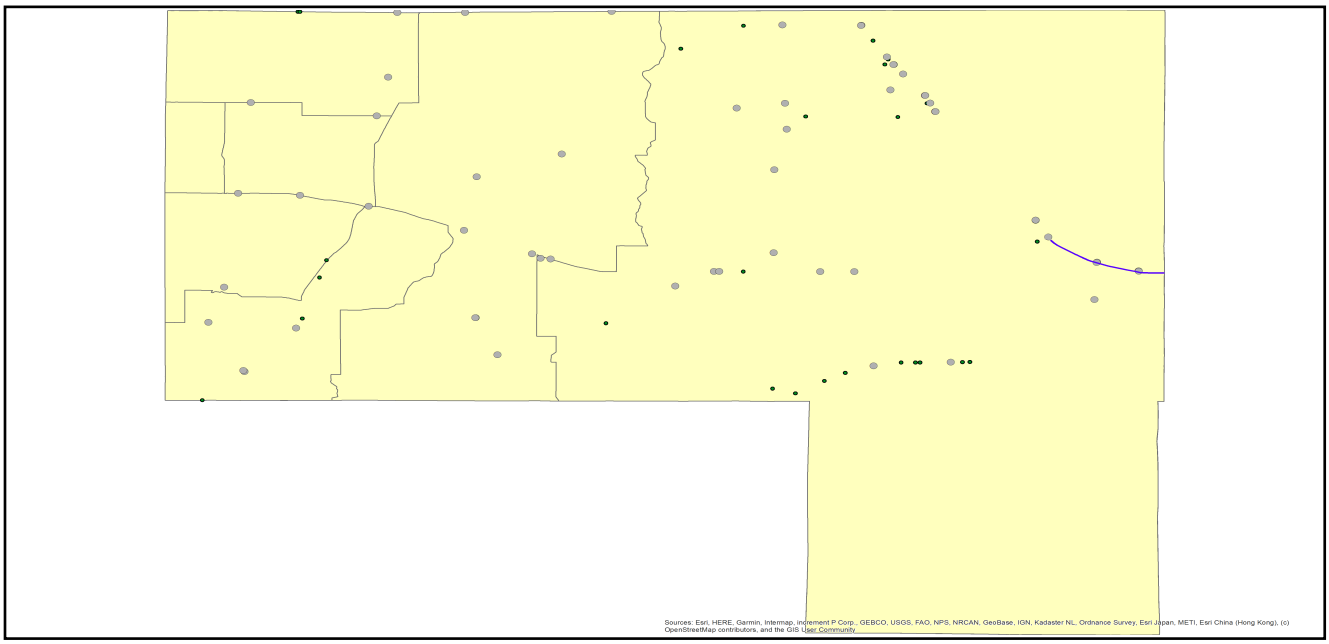


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	7	0	0	7	7
	Bridges	88	0	0	88	88
	Tunnels	2	0	0	2	2
Railways	Segments	12	0	0	12	12
	Bridges	21	0	0	21	21
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	2	0	0	2	2
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	6	0	0	6	6
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	2	2

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	3,703	23	6
Waste Water	2,222	12	3
Natural Gas	49	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	8,380	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

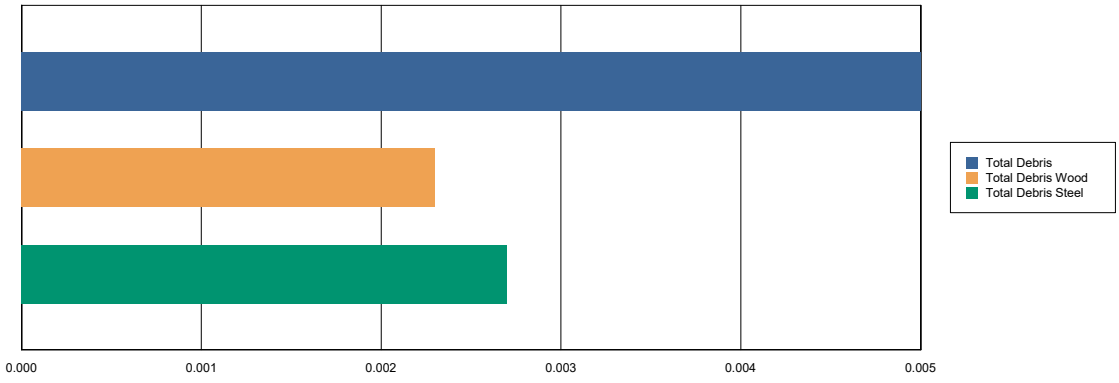
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 46.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



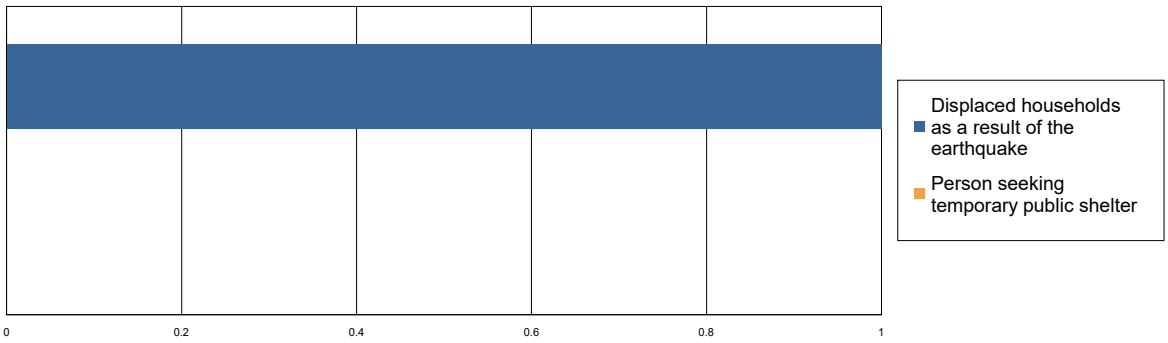
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.00	0.01	200 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 23,086) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1	0

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.05	0.01	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.08	0.01	0.00	0.00
	Other-Residential	0.27	0.03	0.00	0.00
	Single Family	2.38	0.26	0.02	0.03
	Total	**3**	**0**	**0**	**0**
2 PM	Commercial	2.89	0.36	0.02	0.04
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.54	0.07	0.00	0.01
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.58	0.07	0.00	0.01
	Other-Residential	0.04	0.00	0.00	0.00
	Single Family	0.36	0.04	0.00	0.00
	Total	**4**	**1**	**0**	**0**
5 PM	Commercial	2.15	0.27	0.02	0.03
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.02	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.36	0.04	0.00	0.00
	Other-Residential	0.10	0.01	0.00	0.00
	Single Family	0.91	0.10	0.01	0.01
	Total	**4**	**0**	**0**	**0**

Economic Loss

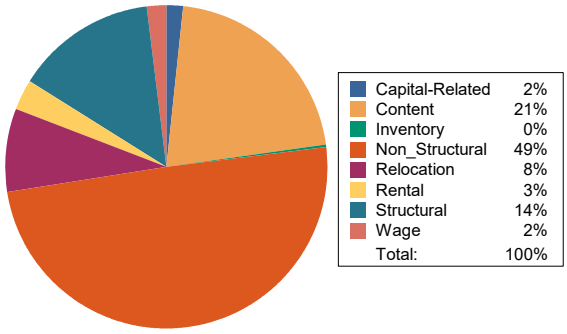
The total economic loss estimated for the earthquake is 37.47 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 21.39 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 72 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

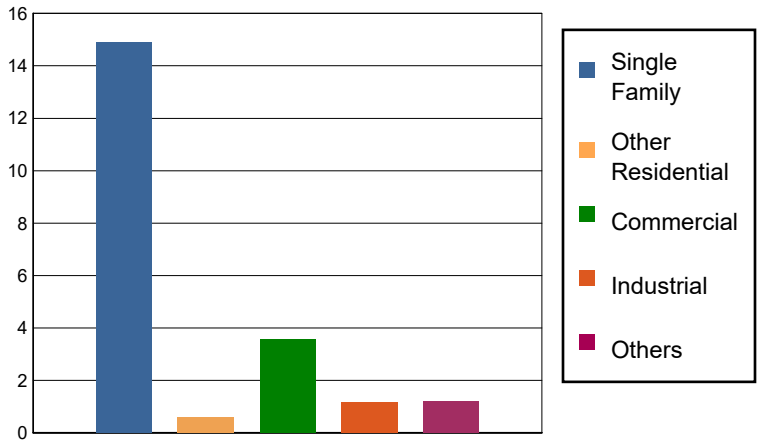


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0197	0.3185	0.0216	0.0483	0.4081
	Capital-Related	0.0000	0.0084	0.3157	0.0121	0.0082	0.3444
	Rental	0.3378	0.0312	0.2557	0.0079	0.0113	0.6439
	Relocation	1.1875	0.0643	0.3438	0.0719	0.1192	1.7867
	Subtotal	**1.5253**	**0.1236**	**1.2337**	**0.1135**	**0.1870**	**3.1831**
Capital Stock Losses							
	Structural	2.1569	0.1068	0.4384	0.1479	0.2147	3.0647
	Non_Structural	8.0798	0.3014	1.1827	0.5238	0.4624	10.5501
	Content	3.1143	0.0626	0.7081	0.3056	0.3188	4.5094
	Inventory	0.0000	0.0000	0.0178	0.0562	0.0134	0.0874
	Subtotal	**13.3510**	**0.4708**	**2.3470**	**1.0335**	**1.0093**	**18.2116**
	Total	**14.88**	**0.59**	**3.58**	**1.15**	**1.20**	**21.39**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	681.6301	0.0000	0.00
	Bridges	97.4009	0.0234	0.02
	Tunnels	6.2656	0.0005	0.01
	Subtotal	**785.2966**	**0.0239**	
Railways	Segments	66.5701	0.0000	0.00
	Bridges	92.6132	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**159.1833**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	8.8203	0.5669	6.43
	Runways	0.0000	0.0000	0.00
	Subtotal	**8.8203**	**0.5669**	
	Total	**953.30**	**0.59**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	119.1732	0.1030	0.09
	Subtotal	**119.1732**	**0.1030**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	756.7828	15.2958	2.02
	Distribution Lines	71.5039	0.0518	0.07
	Subtotal	**828.2867**	**15.3476**	
Natural Gas	Pipelines	47.3639	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	47.6693	0.0177	0.04
	Subtotal	**95.0332**	**0.0177**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Communication	Facilities	0.1940	0.0104	5.36
	Subtotal	**0.1940**	**0.0104**	
	Total	**1,042.69**	**15.48**	

Appendix A: County Listing for the Region

Elbert,CO

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Colorado					
	Elbert	23,086	2,257	383	2,640
Total Region		**23,086**	**2,257**	**383**	**2,640**

8 MITIGATION STRATEGY ACTION IDEAS

Mitigation Strategy Action Ideas

The following ideas for mitigation actions were identified over the course of the hazard mitigation planning process. This list was informed by:

- Community Survey of the residents of Elbert County (93 participants)
- HMP and Discovery Planning processes
- 2018 Comprehensive Plan
- 2017 Hazard Mitigation Plan
- 2021 Transportation Master Plan

- **All Hazards**
  - Evacuation and sheltering planning, including food, medicine, and water distribution
  - Provide support for vulnerable populations during evacuations, include in planning
  - Actionable evacuation pre-planning for large animals and pets, ensure resources are available
  - Provide shelter location information to community as part of planning and education efforts, in case there is not access to the internet during an event
  - Promote and assist citizens in emergency preparedness education and "go bag" kits
  - Identify households for citizens with issues for safe evacuation
  - Establish a hotline for those in need of supplies during storms or emergencies
  - Education and resources, including recordings of workshops, for homeowners to complete mitigation projects
  - Improve public information programming and proactively provide preparedness and response messaging throughout the year
  - Clarify and create signage for exit / evacuation routes on most frequently used roads out of the county
  - Implement coordinated alerts and follow-up messaging, testing of communication channels
  - Create a centralized place online for all hazard information
  - Increase resident relationships and communication to alert neighbors to hazards
  - Invest in and seek federal and state monies to improve telecom in southern and eastern county areas, improve landline infrastructure
  - Educate community on generator installation and safety
  - Install generators at crucial facilities and shelters in the county
  - Improve EMS availability
  - Create a volunteer response team to provide training and clearance to rescue livestock / people
  - Code enforcement to alleviate hazards in neighborhoods
  - Consider adopting / updating building codes and development regulations
  - Address potential limitations on housing development and overcrowding
  - Develop access and functional needs populations' database/inventory/registry
  - Assess and designate shelters and distribute information to public/agencies
  - Asses protective measures needed for historic structures
  - The County should develop and maintain a GIS strategic plan
  - GIS mapping project that visualizes hazards based on location within the county
  - Create a GIS lifeline layer and keep current as development occurs
  - Improve communication and public alerts by increasing cell towers in the county
  - Develop multi-lingual disaster communications, education PSA's and educational videos

- Process for fast-tracking medication and medical equipment deliveries in times of need
- New community level design and community level mitigation / planning efforts
- Locate funding opportunities and improve response times
- Work with County Businesses to develop a Disaster Resistant Business Program
- Develop a comprehensive public education program on the dangers of carbon monoxide during extended power outages
- Develop and begin to implement a systematic process to evaluate and upgrade aging infrastructure
- Alerts/mailings for emergency notification signups and update, family evacuation plans, home inventories
- Countywide community educational programs and events for evacuation planning and emergency notification signups
- Maintain a safe road system within funding limits and including access provided for emergency vehicles where feasible
- Maintain County-wide Zoning and Subdivision Regulations which should include reference to the Hazard Management Plan
- Develop and maintain Site Design Standards (including hazards mitigation) for Commercial and Industrial Developments
- Develop and maintain Site Design Standards (including hazards mitigation) for Residential Developments
- Maintain and update the countywide Multi-Hazard Mitigation Plan as development occurs
- Form and convene the Elbert County Hazard Mitigation Planning Committee
- Improve communication and coordination of mitigation activities between federal, state, and local governments and with private and non-profit organization
- Improve education and awareness of hazards and risk reduction measures
- Educate property owners on insurance availability and type
- Ensure community members understand their responsibility in preparedness and response
- Plan for and exercise communication coordination across multiple agencies and jurisdictions
- Conduct a study to evaluate populations that need additional assistance in terms of hazard mitigation, preparation, evacuation, recovery
- Create clear and concise maps in digital and print forms and make them available to public
- Continue to update and improve the Geographic Information System (GIS) and provide such information to local, state, and federal agencies as determined.
- Include the installation of critical facility generators for FEMA Hazard Mitigation Grant Program projects
- Identify other potential local hazard mitigation funding sources
- Hire a grant writer/manager
- Identify buildings with the potential for sheltering and obtain agreements for use
- Utilize local subject matter experts to plan for power redundancy and equipment as needed
- Develop a hazard events database for documenting damaging events for inclusion into future HMP updates
- Develop a Master Generator Plan for the county

- **Dam / Levee Incident**
  - Assess and repair flood control dams

- Communicate with levee and dam owners to assess conditions
- Work with local conservation districts to obtain funding for monitoring and maintenance of dams which may be in need of repairs
- Work with State Engineer and dams owners to better understand and stay informed of the rules and regulations for reporting to Dam Safety
- Educate public on flood control dam structures, easements, and impacts of new development in dam inundation areas
- Develop a Dam/Levee Public Education and Evacuation Plan for targeted areas of the community
- Develop an outreach program aimed at identifying and assisting private dam owners with repairing or decommissioning at-risk dams.
- Work with operators to ensure common response operations planning
- Form task force to improve coordination with conservation districts, assess condition of dams, and identify funding sources for repair and maintenance
- Study and implement levee improvement program for Kiowa levee

- **Drought**
  - Community outreach and awareness about water usage, especially new county residents
  - Address sprinkler systems (home and landscaping overuse with developers
  - Increase water storage
  - Install new water lines for cleaner town water
  - Require HOAs to allow windmills or solar backup for well pumps
  - The county should consider the requirement of development plans to include water conservation measures which prolong water supplies and the economic life of aquifers.
  - The county should encourage the extension of centralized water resources to rural subdivisions and other development
  - Identify and implement water line replacement projects
  - Identify and implement water delivery system improvements
  - Develop education and incentives program to encourage water savings measures by citizens
  - Drought restriction plans for municipal utilities & wells
  - Enforcement of rules/laws concerning residential wells to prevent all water usage for hot tubs, gardens, greenhouses, etc.
  - Build a water treatment facility
  - Invest in an atmospheric water generator, which pulls moisture from the air to collect water
  - Implementing gray water / home treatment measures to mitigate drought
  - Develop a public education on drought resistance
  - Identify alternative water supplies for time of drought. Mutual aid agreements with alternative suppliers
  - Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their homes
  - Develop standards that require drought resistant landscapes on county and community owned facilities
  - Implement stormwater retention in regions ideally suited for groundwater recharges.

Mitigation Strategy Action Ideas

  - Develop a residential and local business program to modify plumbing systems - i.e., water saving kits
  - Aquifer monitoring and potential recharge
- **Earthquake**
  - Incorporate earthquakes in the Office of Emergency Management public outreach strategy
  - Work with Colorado Geological to continue the study and analyze earthquakes related to appropriate levels of seismic safety in building codes and practices
  - Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities
  - Develop a post disaster action plan that includes grant funding and debris removal components
- **Extreme Heat**
  - Review the safety of playground materials
  - Educate county residents on heat exposure symptoms and best practices
  - Plan for a cooling center in the case of residents needing respite from extreme heat
- **Flood**
  - Repair county roads and bridges, improve infrastructure for resilience to flooding
  - Assess impacts of bridge washout over the creek at 86 and 166, simultaneously
  - Re-slope drainage ditches; repair, replace, and clean culverts
  - Mitigation actions for areas damaged by fires, erosion control
  - Improved storm water drainage for communities
  - The county should develop a county-wide drainage/erosion mitigation plan — coordinating objectives of various agencies to reduce future flood damage
  - Deliver a “refresher” NFIP workshop to community leaders and elected officials
  - Form a Stormwater Utility District for funding Stormwater projects
  - Provide maintenance and improvements to existing drainage channels and other pertinent storm drainage conveyances
  - Implement flood containment structures, require designs/engineering to reduce flood risk
  - Continued road maintenance for improved evacuation routes
  - Education and assistance in homeowner responsibility to maintain ditches
  - Coordinate with Transportation to complete flood improvement projects for transportation routes
  - Complete bridge improvements, assist Transportation
  - Complete road paving projects, support efforts for Transportation
  - Consider establishing an administrative procedure or change in County/City codes for requiring builders to develop a site drainage plan ensuring “no adverse impact” when they apply for permits for new residential construction
  - Complete GIS and other automated inventories for stormwater, problem drainage areas, DFIRM and other assets
  - Explore & articulate value for gauge placements and option to recommend placements for gauges
  - Improve coordination between Community Development, Building, and Road and Bridge departments related to the National Flood Insurance Program(NFIP)
  - Identify and implement flood mitigation actions for Kiowa schools

Mitigation Strategy Action Ideas

- **Hazardous Materials Release**
  - Public education on hazardous materials and shelter-in-place procedures
  - Coordinate with responding agencies to ensure responder's capabilities are sufficient for safety, training, and equipment
- **Public Health Hazards**
  - Improve resources for public health department for information availability and presence
  - Improve ability to test large amounts of the population with timely results
  - Improve ability to contact trace those with confirmed cases of the disease
  - Provide education and outreach to the community to improve compliance with public health orders
  - Monitor air pollution during fires
  - Monitor water quality, especially if aquifers reach extreme lows
- **Severe Weather**
  - Improve storm water drainage
  - Prepare roads by grading and ditching to minimize road washout
  - Build storm shelters
  - Adopt a storm ordinance
  - Pursue StormReady designation
  - Identify and prioritize locations for stormwater drainage system improvements. Devise an implementation plan for identified stormwater projects
  - Install Lightning Warning & Alert Systems in public recreation areas
  - Install lightning rods on public structures
- **Severe Winter Weather**
  - Improve emergency storm management
  - Improve winter road maintenance
  - Removal / trimming of trees in rights of way
    - Address county and town responsibility in trimming and removing trees that present a risk to community members and private property.
    - Zoning and planning to enforce mitigation of tree maintenance
  - Education about not using heaters inside
  - Develop a winter storm response plan that encompasses sheltering procedures, access/functional needs prioritization, and organized multi-agency response
- **Tornado**
  - Removal / trimming of trees
    - County and town responsibility in trimming and removing trees that present a risk to community members and property
  - Develop a SafeRoom plan for county/community facilities
  - Individual SafeRoom rebate program
  - Develop a program which encourages residents to trim or remove trees that could affect power lines
  - Develop a program which encourages residents to obtain a NOAA weather radio
  - Secure emergency generators (or alternative power sources) for all critical and vital facilities
  - Develop a program which encourages residents to be prepared including generators, 72-hour self-sufficiency kits, NOAA radios, etc.

Mitigation Strategy Action Ideas

- Establish and enforce building codes that require all roofs to withstand high wind loads
- Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors
- Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines
- Build a tornado shelter
- Plan and upgrade the existing tornado public warning system

- **Wildfire**
  - Establish fuel breaks along county roads by removing excess fuels in the right of way, especially heavy traffic roads that are ingress/egress for high density residential areas
  - Free slash disposal or chipping services for property owners completing mitigation
  - Provide and support low-cost or free options for property owners to complete fire mitigation
  - Provide tax relief incentives to landowners completing wildfire mitigation activities
  - Address need for dead tree pile disposal, no burn policy is creating dangerous situation
  - Fire risk assessment and mitigation on all forested areas around Elizabeth and the county
  - Complete fuel thinning in the forest to reduce fire risk
  - Community education around wildfire and mitigation, including Firewise
  - Establish a countywide Wildfire Council educate on and implement mitigation measures, apply for grant opportunities
  - Consideration of WUI codes by the planning commission, potentially update building codes
  - Complete assessments on majority of properties within county during HMP planning period
  - Use large goat herds to assist in mitigation by reducing fuels
  - Require fire mitigation from all property owners
  - Community sheltering plan in the case of large fires
  - As development occurs, the county and developers should cooperate in providing funding to update existing facilities and construct additional fire protection facilities – especially in rural areas where fire equipment and protection may not be readily available.
  - Bury powerlines
  - Landscape public areas with Firewise plants and educate community on the principles
  - Educate elected officials and the public on continued need for improved water supplies
  - Review operating plans to determine annual project needs, apply for grant funding as available
  - Provide owners with information on the use and benefits of fire-resistant construction materials
  - Assist homeowners with installing approved, reflective address signs at driveway entrance
  - Educate owners on composition and benefits of a healthy forest and actions to maintain it
  - Seek funding to purchase equipment to assist with fuel reduction and maintain efforts
  - Install emergency evacuation road signage, including dead end identification
  - Collaborate with community officials to improve county owned subdivision roads, with emphasis on widening to NFPA standards and removal of obstructive vegetation
  - Support community in obtaining funding for the installation of engineered National Fire Protection Association (NFPA) compliant emergency dry barrel fire use cisterns
  - Post maps in accessible locations to “paint the picture” of wildfire risk and demonstrate successes to partners and citizens – include past and planned mitigation projects
  - Create and train a Subject Matter Experts group on the CWPP to educate the community
  - Identify and engage community leaders or “champions” to increase capacity and mitigation

Mitigation Strategy Action Ideas

- Train individuals to conduct Home Ignition Zone assessments and provide education
- Engage community members beyond media messaging about risk, such as events
- Offer incentives such as cost-share funds, free home risk assessment, on-site advice
- Coordinate with neighborhoods and communities to identify individual preparation steps, fuel reduction, emergency access and egress, evacuation plans and safe zones
- Promote community preparedness, not only defensible space
- Utilize chipper rental programs or request programs
- Encourage consistent address signage and driveway access for emergency services and wildfire protection
- Develop wildland urban interface GIS data and maps
- Develop zoning updates and outreach for defensible space
- Develop a Wildland Urban Interface (WUI) code and standards
- Complete an updated countywide CWPP coordinated with the 5-year HMP update
- Potential for utilizing existing water sources to support ponds/water sources for wildfire suppression – dip sites.
- Utilize building codes / fire-specific codes - Defensible space
- Establish air quality monitoring program

9 HAZARD MITIGATION PLANNING COMMITTEE ROSTER

Name	Title	Organization
Aaron Craigie	Deputy Fire Chief	Rattlesnake FPD
Bart Greer	Contracting	Elbert County
BOCC	Commissioners	Elbert County
Bryant McCall	Emergency Manager	Washington County
Byron McDaniel	Volunteer	Elbert County
Cass Kilduff	Chief	Rattlesnake FPD
Chris Richardson	Chair, BOCC	Elbert County
Dave Fisher	Undersheriff	Elbert County
Debrah Schnackenberg	Emergency Manager	Douglas County
Dwayne Smith	Director of Public Health	Elbert County
Emily Palmer	Hazard Mitigation Planning Specialist	State DHSEM
Gerry Lamansky	Chief	Kiowa FPD
Greg Thompson	Director of Community Development Services	Elbert County
Homer Boys	Chief	Elbert FPD
Irene Merrifield	Mitigation Planning Lead	State DHSEM
Janet Maloney		Kiowa Conservation District
Jerrel Rector	Deputy Chief	Agate Fire District
Jimmy H	Chief	Big Sandy Fire District
Kara Gerczynski	Fire Marshall	Elizabeth FPD
Kay Osborn	Fire Chief	North Central FPD
Kelli Loflin	Superintendent	Elbert School District
Ken Stroud	Emergency Manager	Lincoln County
Kim Boyd	Town Administrator	Town of Kiowa

Kim Nelson	Volunteer	Elbert County
Larry Rector	Chief	Agate Fire District
Lloyd Standard	Deputy Chief	Rattlesnake FPD
Lonnie Inzer	Emergency Manager	El Paso County
Mark Thompson	SHMO	State DHSEM
Melvin Berghahn	Chief of Police	Town of Elizabeth
Mike Newton	Director Safety & Emergency Planning	Elizabeth School District & ECSSG
Nathan Fogg	Emergency Manager	Arapahoe County
Nick Carnesi	Training Battalion Chief	Elizabeth FPD
Patrick Davidson	Town Administrator	Town of Elizabeth
Rachel Turner	North Central District Manager	CO State Land Board
Rick Pettitt	Commissioner	Elbert County
Rory Hale	Director of Public Works	Elbert County
Sean Mackall	EMS Battalion Chief	Elizabeth FPD
Shane Pynes	Emergency Manager	Elbert County
Spencer Weston	Franktown Field Office Supervisor	CSFS
Steve Wilson	Superintendent	Big Sandy School District
Tim Johnson	Emergency Manager	Douglas County
Tim Norton	Sheriff	Elbert County
TJ Steck	Chief	Elizabeth FPD
Tony Schiefelbein	Chief	Simla PD
Travis Hargreaves	Superintendent	Kiowa Schools
Trish Kruse	County Administrator / PIO	Elbert County
William Dallas	Superintendent	Elizabeth School District
Zane Card	Deputy Chief	North Central FPD

10 MEETING AGENDAS, INVITES, AND PARTICIPANTS

HMP Kickoff Webinar

Thursday, May 26, 2022 / 10-11:30 AM
Join on your computer or smart phone: click here to join the meeting
Or call in (audio only): 1.720.928.9299 / ID: 895 5419 3387 / Passcode: 872481

Agenda:

1. Hazard Mitigation Overview
2. Project Scope & Schedule
3. Roles & Responsibilities
4. Public Involvement Strategy
5. 2017 HMP Input
6. Recent Community Planning
7. Hazards to Profile
8. Recent Hazard Events
9. Lifelines
10. Mitigation Strategy
11. Mitigation Grant Funding
12. Next Steps
13. Mitigation Resources

Hazard Mitigation Planning Committee (HMPC) Post-Meeting Requests:

- Best Available Hazard Data & Reports
- Recent Community Plans
- HMPC Roster Additions
- Help to Share Public Engagement Content
- 2017 Mitigation Action Reporting

QUESTIONS, COMMENTS, CONCERNS? –

CONTACT PROJECT MANAGER MICHAEL GARNER AT ANY POINT THROUGHOUT THE PLANNING PROCESS:
303.710.9498 | MGARNER@SYNERGY-DR.COM

Mike Garner

Subject: Elbert County Hazard Mitigation Kick Off
Location: https://us06web.zoom.us/j/89554193387?pwd=MGUwb1BocExJR3RYYXBLMVZ1RE9TZz09

Start: Thu 5/26/2022 10:00 AM
End: Thu 5/26/2022 11:30 AM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Shane Pynes
Required Attendees Shane Pynes; Mike Garner; Sam Albrecht; Trish Kruse
Optional Attendees: BOCC; Patrick Davidson; Kim Boyd; Fire Chiefs - Elbert CO; Elbert Law Enforcement; Douglas Bissonette; Volunteers; Mike Newton; Kelli Loflin; Silvia McNeely; Steve Wilson; town_simla@fairpoint.net; Rory Hale; Dwayne Smith; Greg Thompson; Dave Fisher; john.hogan@ncfpd.us; Melvin Berghahn; Kara Gerczysnki; Kim Nelson; TJ Steck; Jeff Brown

Categories: Elbert

Update:

Please see the attached Kickoff Agenda.

Good afternoon,

Please join us for an overview of Elbert County's hazard mitigation assessment and planning. This will kick off the multi-month process for renewing the Elbert County 2016 Hazard Mitigation Plan by including stakeholders' experiences and expertise on a myriad of hazard and risk related matters for the county.

Regards,

Shane Pynes

Director

Office of Emergency Management

Elbert County

Elbert County OEM is inviting you to a scheduled Zoom meeting.

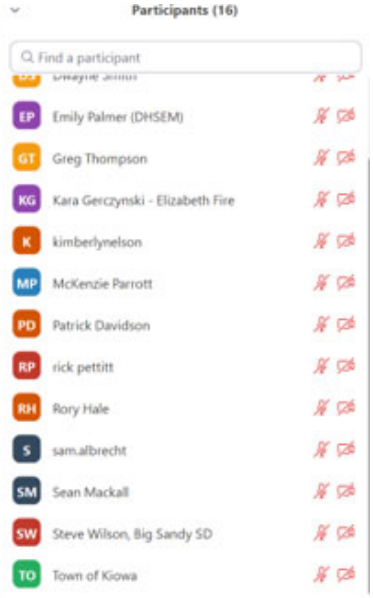
Join Zoom Meeting
https://us06web.zoom.us/j/89554193387?pwd=MGUwb1BocExJR3RYYXBLMVZ1RE9TZz09

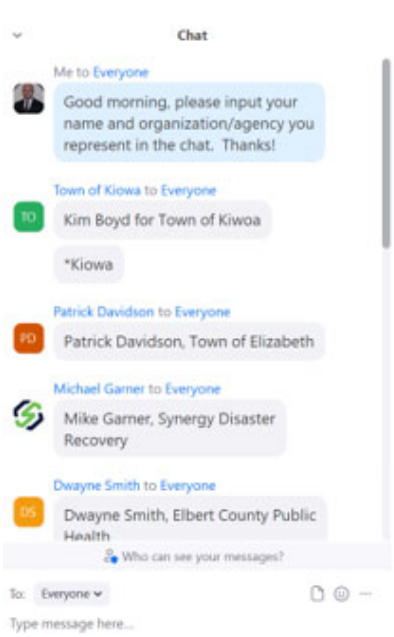
Meeting ID: 895 5419 3387
Passcode: 872481

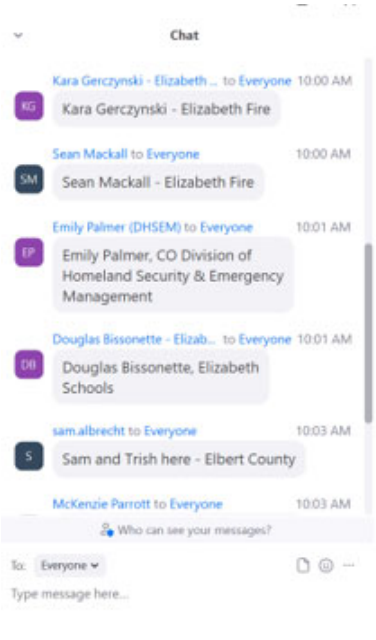
Elbert County Hazard Mitigation Kickoff Meeting 5/26/22

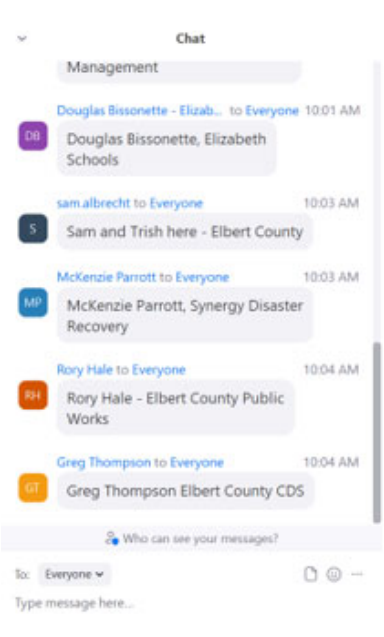
Chat Log and Call Attendance











HMP Risk Assessment Workshop

Tuesday August 16, 2022 / 10-11:30 AM
Commissioner's Board Room (top floor)
215 Comanche St., Kiowa, CO 80117

Agenda:

1. Project Overview & Updates
2. Public Involvement Strategy
3. Risk Assessment Summary
4. Mitigation Strategy
5. Community Wildfire Protection Plan
6. Mitigation Grant Funding
7. Mitigation Resources
8. Next Steps

Hazard Mitigation Planning Committee (HMPC) Post-Meeting Requests:

- Hazard Ranking Survey (for Plan Adoptees)
- Review Draft Risk Assessment Chapter
- In-kind Tracking
- Hazard / Disaster / Mitigation Photos
- Remaining 2017 Mitigation Action Reporting (for Plan Adoptees)
- Remaining Mitigation Capability Assessments (for Plan Adoptees)

QUESTIONS, COMMENTS, CONCERNS? –

CONTACT PROJECT MANAGER MICHAEL GARNER AT ANY POINT THROUGHOUT THE PLANNING PROCESS:
303.710.9498 | MGARNER@SYNERGY-DR.COM

Mike Garner

Subject: Elbert County Hazard Mitigation Plan - Risk Assessment Workshop
Location: 215 Comanche St., Kiowa, CO 80117 (Commissioner's Board Room - top floor)

Start: Tue 8/16/2022 10:00 AM
End: Tue 8/16/2022 11:30 AM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Mike Garner
Required Attendees: aaron.craigie@rsfpd.org; BOCC@elbertcounty-co.gov; Byron.McDaniel@elbertcounty-co.gov; chief_253@rattlesnakefirerescue.com; chief_52@rattlesnakefirerescue.com; Dave.Fisher@elbertcounty-co.gov; dbissonette@esdk12.org; Dwayne.Smith@elbertcounty-co.gov; emily.palmer@state.co.us; g.lamansky@kiowafire.com; Greg.Thompson@elbertcounty-co.gov; homer.boys@yahoo.com; irene.merrifield@state.co.us; jimjrhaus@gmail.com; jkrector@amtca.net; kara@elizabethfire.org; kay.osborn@ncfpd.us; kboyd@townofkiowa.com; Kim.Nelson@elbertcounty-co.gov; kiowacd@gmail.com; kloflin@elbertschool.org; lincolncountyoem@gmail.com; lonnieinzer@elpasoco.com; Lrector@amtca.net; markw.thompson@state.co.us; mberghahn@townofelizabeth.org; mnewton@esdk12.org; n.carnesi@elizabethfire.org; NFogg@arapahoegov.com; oem@co.washington.co.us; pdavidson@townofelizabeth.org; Rick.Pettitt@elbertcounty-co.gov; Rory.Hale@elbertcounty-co.gov; s.mackall@elizabethfire.org; Shane.Pynes@elbertcounty-co.gov; swilson@bigsandy100j.org; thargreaves@kiowaschool.org; Tim.Norton@elbertcounty-co.gov; tjs@elizabethfire.org; tmjohnso@dcsheriff.net; tony@townofsimla.com; town_simla@fairpoint.net; Trish.Kruse@elbertcounty-co.gov; zane.card@ncfpd.us; Caitlin Langmead; Weston,Spencer
Optional Attendees: Debrah Schnackenberg; Chris Richardson

Categories: Elbert

Update: Our agenda for next week's workshop is attached. Please note this will be an in-person meeting. All local governments planning to adopt the updated HMP are strongly encouraged to attend.

Hello,
Please join us in-person for our second Hazard Mitigation Planning Committee meeting.

The main agenda items will be a thorough review of our recently conducted risk assessment, in addition to continued discussion relating to the plan's updated mitigation strategy.

Full agenda to be posted in the future.

Thanks,
mike

Risk Assessment Workshop - 8/16/2022

Name	Title	Organization	Email	Present
Aaron Craigie	Deputy Fire Chief	Rattlesnake FPD	aaron.craigie@rsfpd.org	
Bart Greer	Contracting	Elbert County		
BOCC	Commissioners	Elbert County	BOCC@elbertcounty-co.gov	
Bryant McCall	Emergency Manager	Washington County	oem@co.washington.co.us	
Byron McDaniel	Volunteer	Elbert County	Byron.McDaniel@elbertcounty-co.gov	
Cass Kilduff	Chief	Rattlesnake FPD	chief_52@rattlesnakefirerescue.com	
Dave Fisher	Undersheriff	Elbert County	Dave.Fisher@elbertcounty-co.gov	
Debrah Schnackenberg	Emergency Manager	Douglas County	dschnacken@dcsheriff.net	
Dwayne Smith	Director of Public Health	Elbert County	Dwayne.Smith@elbertcounty-co.gov	DSS EX
Emily Palmer	Hazard Mitigation Planning Specialist	State DHSEM	emily.palmer@state.co.us	
Gerry Lamansky	Chief	Kiowa FPD	g.lamansky@kiowafire.com	
Greg Thompson	Director of Community Development Services	Elbert County	Greg.Thompson@elbertcounty-co.gov	GT
Homer Boys	Chief	Elbert FPD	homer.boys@yahoo.com	
Irene Merrifield	MITIGATION PLANNING	State DHSEM	irene.merrifield@state.co.us	IM
Jerrel Rector	Deputy Chief	Agate Fire District	jkrector@amtca.net	
Jimmy H	Chief	Big Sandy Fire District	jimjrhaus@gmail.com	
Kara Gerczynski	Fire Marshall	Elizabeth FPD	kara@elizabethfire.org	
Kay Osborn	Fire Chief	North Central FPD	kay.osborn@ncfpd.us	
Kelli Loflin	Superintendent	Elbert School District	kloflin@elbertschool.org	
Ken Stroud	Emergency Manager	Lincoln County		
Kim Boyd	Town Administrator	Town of Kiowa	kboyd@townofkiowa.com	KAB
Kim Nelson	Volunteer	Elbert County	Kim.Nelson@elbertcounty-co.gov	
Larry Rector	Chief	Agate Fire District	Lrector@amtca.net	
Lloyd Standard	Deputy Chief	Rattlesnake FPD	chief_253@rattlesnakefirerescue.com	
Lonnie Inzer	Emergency Manager	El Paso County	lonnieinzer@elpasoco.com	
Mark Thompson	SHMO	State DHSEM	markw.thompson@state.co.us	
Melvin Berghahn	Chief of Police	Town of Elizabeth	mberghahn@townofelizabeth.org	
Mike Newton	Director Safety & Emergency Planning	Elizabeth School District & ECSSG	mnewton@esdk12.org	MN
Nathan Fogg	Emergency Manager	Arapahoe County	NFogg@arapahoegov.com	
Nick Carnesi	Training Battalion Chief	Elizabeth FPD	n.carnesi@elizabethfire.org	
Patrick Davidson	Town Administrator	Town of Elizabeth	pdavidson@townofelizabeth.org	X
Rachel Turner	North Central District Manager	CO State Land Board	rachel.turner@state.co.us	
Rick Pettitt	Commissioner	Elbert County	Rick.Pettitt@elbertcounty-co.gov	
Rory Hale	Director of Public Works	Elbert County	Rory.Hale@elbertcounty-co.gov	
Sean Mackall	EMS Battalion Chief	Elizabeth FPD	s.mackall@elizabethfire.org	

Risk Assessment Workshop - 8/16/2022

Name	Title	Organization	Email	Present
Shane Pynes	Emergency Manager	Elbert County	Shane.Pynes@elbertcounty-co.gov	SP
Spencer Weston	Franktown Field Office Supervisor	CSFS	spencer.weston@colostate.edu	SS
Steve Wilson	Superintendent	Big Sandy School District	swilson@bigsandy100j.org	
Tim Johnson	Emergency Manager	Douglas County		
Tim Norton	Sheriff	Elbert County	Tim.Norton@elbertcounty-co.gov	TN
TJ Steck	Chief	Elizabeth FPD	tjs@elizabethfire.org	
Tony Schiefelbein	Chief	Simla PD	tony@townofsimla.com	
Travis Hargreaves	Superintendent	Kiowa Schools	thargreaves@kiowaschool.org	
Trish Kruse	County Administrator / PIO	Elbert County	Trish.Kruse@elbertcounty-co.gov	TK
William Dallas	Superintendent	Elizabeth School District	bdallas@esdk12.org	
Zane Card	Deputy Chief	North Central FPD	zane.card@ncfpd.us	
RICHARDSON, CHRIS	CHIEF, EOC	EL CO	chris.richardson@elbertcounty-co.gov	
Melvin Berghahn	Elizabeth Police Chief	Elizabeth Police	MBerghahn@Townofelizabethco.gov	MB

HMP Mitigation Strategy Workshop

Tuesday October 25, 2022 / 10:30 AM -12:00 PM

In-person (encouraged):
Commissioner's Board Room (top floor)
215 Comanche St., Kiowa, CO 80117

Virtual (via Zoom):
https://us06web.zoom.us/j/8145016104?pwd=QVZRcFNtVGZjUTQxZktSYnVZbmhUZz09
Meeting ID: 814 501 6104 / Passcode: 291856 / Dial-In: 720.928.9299

Agenda:

1. Project Overview & Updates
2. Local Government Participation
3. Updated Hazard Risk & Vulnerability chapter
4. Community Wildfire Protection Plan
5. Plan Integration / Implementation
6. Plan Maintenance / Continued Public Engagement
7. Updated Mitigation Strategy
8. Mitigation Grant Funding
9. Mitigation Resources
10. Next Steps

Hazard Mitigation Planning Committee (HMPC) Post-Meeting Requests:

- New
  - Comments on Draft Risk Assessment Chapter
  - New Mitigation Action Development (for Plan adoptees)
- Outstanding (for some Plan adoptees)
  - Hazard Ranking Survey
  - 2017 Mitigation Action Reporting
  - Mitigation Capability Assessments
- Ongoing - In-kind Tracking

QUESTIONS, COMMENTS, CONCERNS? –

CONTACT PROJECT MANAGER MICHAEL GARNER AT ANY POINT THROUGHOUT THE PLANNING PROCESS:
303.710.9498 | MGARNER@SYNERGY-DR.COM

Mitigation Strategy Workshop - 10/25/2022

Name	Title	Organization	Email	Present
Aaron Craigie	Deputy Fire Chief	Rattlesnake FPD	aaron.craigie@rsfpd.org	
Bart Greer	Contracting	Elbert County		
BOCC	Commissioners	Elbert County	BOCC@elbertcounty-co.gov	
Bryant McCall	Emergency Manager	Washington County	oem@co.washington.co.us	
Byron McDaniel	Volunteer	Elbert County	Byron.McDaniel@elbertcounty-co.gov	
Cass Kilduff	Chief	Rattlesnake FPD	chief_52@rattlesnakefirerescue.com	
Chris Richardson	Chair, BOCC	Elbert County	chris.richardson@elbertcounty-co.gov	
Dave Fisher	Undersheriff	Elbert County	Dave.Fisher@elbertcounty-co.gov	
Debrah Schnackenberg	Emergency Manager	Douglas County	dschnacken@dcsheriff.net	
Dwayne Smith	Director of Public Health	Elbert County	Dwayne.Smith@elbertcounty-co.gov	DSS
Emily Palmer	Hazard Mitigation Planning Specialist	State DHSEM	emily.palmer@state.co.us	ONLINE
Gerry Lamansky	Chief	Kiowa FPD	g.lamansky@kiowafire.com	
Greg Thompson	Director of Community Development Services	Elbert County	Greg.Thompson@elbertcounty-co.gov	X
Homer Boys	Chief	Elbert FPD	homer.boys@yahoo.com	
Irene Merrifield	Mitigation Planning Lead	State DHSEM	irene.merrifield@state.co.us	
Janet	Maloney	Kiowa Conservation District	kiowacd@gmail.com	
Jerrel Rector	Deputy Chief	Agate Fire District	jkrector@amtca.net	
Jimmy H	Chief	Big Sandy Fire District	jimjrhaus@gmail.com	
Kara Gerczynski	Fire Marshall	Elizabeth FPD	kara@elizabethfire.org	
Kay Osborn	Fire Chief	North Central FPD	kay.osborn@ncfpd.us	
Kelli Loflin	Superintendent	Elbert School District	kloflin@elbertschool.org	
Ken Stroud	Emergency Manager	Lincoln County		
Kim Boyd	Town Administrator	Town of Kiowa	kboyd@townofkiowa.com	
Kim Nelson	Volunteer	Elbert County	Kim.Nelson@elbertcounty-co.gov	x
Larry Rector	Chief	Agate Fire District	Lrector@amtca.net	
Lloyd Standard	Deputy Chief	Rattlesnake FPD	chief_253@rattlesnakefirerescue.com	
Lonnie Inzer	Emergency Manager	El Paso County	lonnieinzer@elpasoco.com	
Mark Thompson	SHMO	State DHSEM	markw.thompson@state.co.us	
Melvin Berghahn	Chief of Police	Town of Elizabeth	mberghahn@townofelizabeth.org	
Mike Newton	Director Safety & EM Planning	Elizabeth School District & ECSSG	mnewton@esdk12.org	
Nathan Fogg	Emergency Manager	Arapahoe County	NFogg@arapahoegov.com	
Nick Carnesi	Training Battalion Chief	Elizabeth FPD	n.carnesi@elizabethfire.org	
Patrick Davidson	Town Administrator	Town of Elizabeth	pdavidson@townofelizabeth.org	ONLINE
Rachel Turner	North Central District Manager	CO State Land Board	rachel.turner@state.co.us	
Rick Pettitt	Commissioner	Elbert County	Rick.Pettitt@elbertcounty-co.gov	

Mitigation Strategy Workshop - 10/25/2022

Name	Title	Organization	Email	Present
Rory Hale	Director of Public Works	Elbert County	Rory.Hale@elbertcounty-co.gov	
Sean Mackall	EMS Battalion Chief	Elizabeth FPD	s.mackall@elizabethfire.org	
Shane Pynes	Emergency Manager	Elbert County	Shane.Pynes@elbertcounty-co.gov	SP
Spencer Weston	Franktown Field Office Supervisor	CSFS	spencer.weston@colostate.edu	
Steve Wilson	Superintendent	Big Sandy School District	swilson@bigsandy100j.org	ONLINE
Tim Johnson	Emergency Manager	Douglas County		
Tim Norton	Sheriff	Elbert County	Tim.Norton@elbertcounty-co.gov	
TJ Steck	Chief	Elizabeth FPD	tjs@elizabethfire.org	ONLINE
Tony Schiefelbein	Chief	Simla PD	tony@townofsimla.com	
Travis Hargreaves	Superintendent	Kiowa Schools	thargreaves@kiowaschool.org	
Trish Kruse	County Administrator / PIO	Elbert County	Trish.Kruse@elbertcounty-co.gov	TK
William Dallas	Superintendent	Elizabeth School District	bdallas@esdk12.org	
Zane Card	Deputy Chief	North Central FPD	zane.card@ncfpd.us	

Find a participant

Michael Garner (Me)

TK Trish Kruse (Host)

CL Caitlin Langmead

EP Emily Palmer

K kempi

PD Patrick Davidson

SW Steve Wilson, Big Sandy SD

 TJ Steck

11 FEMA APPROVAL AND LOCAL GOVERNMENT ADOPTIONS

March 28, 2023

Management Team Updates

Community Development – Zach Higgins

- *Community Development has hired a new Planner/Project Manager. Alexandra Cramer started on 03/17/2023.*
- *The BOT and MSBOD workshop is scheduled for 04/01/2023 from 9am-noon to discuss the Main Street Streetscape Design.*
- *Staff had the kickoff call with BBC Research regarding the Impact Fee Study on 03/16/2023. Staff is now working on collecting/compiling all needed data to complete the study.*
- *The MSBOD and HAB have given formal recommendation of a request to include a façade improvement grant into the budget for 2024.*
- *The HAB continues to work on the creation of the first Historic District in Town and update the Design Guidelines in relation to Historic and adjacent buildings.*
- *The HAB has decided to pursue additional properties for local historic register designation.*
- *The HAB has formally designated 09/30/2023 for this year's Walk and Talk.*
- *The Taylor Building/Bank Building/188 South Main Street has formally been added to the National Register of Historic Places. This is the first building within the Town of Elizabeth to receive this recognition.*
- *The MSBOD is continuing their work on creating a 5k event to occur at 8am on 09/23/2023.*
- *The Planning Commission will continue their Planning Commissioner Training series from the American Planning Association in the coming weeks.*
- *Staff and two MSBOD members will be attending the Main Street Now Conference in Boston from 03/27 – 03/29.*

Town Clerk – Michelle Oeser

- Staff would like to discuss and receive possible direction on a name for the Town movie night, and a possible movie choice. The movie isn't as urgent as a name. I would like to advertise the event with the correct name.
- Dianna found that several years ago, when a movie night was held, a survey was put out for the public to choose the name. I have attached names of movies we found and would like direction if the Board would like to choose 3, and then put out a survey for final decision, or if the Board would like to choose.
- Harmony is working with the school to get student group vendors for the movie night.
- Harmony is working on securing Election Judges for the May 16th election.
- Hannah has been working closely with the auditors over the last few weeks. Auditors will be in the office this Thursday.
- Staff from all departments participated in a CIRSA training on 1st Amendment participants. It was a very helpful and informative training.
- An all-staff meeting was held on March 22nd.
- Harmony and Michelle met with Mandy (Police Department) to discuss options for Police and Court processes to work together and use less paper files.

- Allison has been processing Business Licenses renewal and has sent out letters to Food Truck owners regarding the new Ordinance.

Finance – Hannah Bruce

- During the audit process, one of the journal entries was for the Conservation Trust Fund that was received in 2021. The original entry was to a Cash Allocation account which was showing an outstanding balance on the Combined Cash Investment sheet of the Financial Statements. The correct entry was made in October and the auditors entry was reversing to the original. I will meet with them when they are on-site to get the matter resolved and ensure it is not showing outstanding on the financial statements.

Police –

- Report attached

Public Works and Utilities – Mike DeVol

- No Report

TO: Honorable Mayor and Board of Trustees
FROM: Michelle M. Oeser, Town Clerk
DATE: March 28, 2023
SUBJECT: Event Name Idea and Movie Ideas

Idea for event name

Elizabeth Birthday Bash Under the Stars

Movie ideas

Sandlot

Finding Nemo

a Bug's life

Original Space Jam

Up

Toy Story

Despicable Me

Jungle Book

Land Before Time

Cars

TOWN OF ELIZABETH
COMBINED CASH INVESTMENT
JANUARY 31, 2023

COMBINED CASH ACCOUNTS

99-100013	CASH CLEARING - BOND & RESTITU	(1,000.00)
99-104201	COLOTRUST INVESTMENT ACCOUNT	12,960,500.99
99-104202	CORE ARPA ACCOUNT	154,204.48
99-104203	CORE INVESTMENT ACCOUNT	4,460,450.70
99-105200	CBOC (WATER SEWER)	2,201,298.51
	TOTAL COMBINED CASH	19,775,454.68
99-100001	CASH ALLOCATED TO OTHER FUNDS	(19,775,454.68)
	TOTAL UNALLOCATED CASH	.00

CASH ALLOCATION RECONCILIATION

10	ALLOCATION TO GENERAL FUND	2,521,213.25
21	ALLOCATION TO STREET FUND	950,499.09
31	ALLOCATION TO CAPITAL IMPROVEMENT FUND	8,559,690.61
32	ALLOCATION TO STREET CAPITAL IMPROVEMENT FND	3,056,524.72
52	ALLOCATION TO WATER SEWER FUND	4,573,096.73
	TOTAL ALLOCATIONS TO OTHER FUNDS	19,661,024.40
	ALLOCATION FROM COMBINED CASH FUND - 99-100001	(19,775,454.68)
	ZERO PROOF IF ALLOCATIONS BALANCE	(114,430.28)

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

GENERAL FUND

ASSETS

10-100001	CASH IN COMBINED CASH FUND	2,521,213.25	
10-101000	PETTY CASH	200.00	
10-101100	PETTY CASH- POLICE DEPT	100.00	
10-102200	CONSERVATION TRUST FUND	114,430.28	
10-110000	PROPERTY TAXES RECEIVABLE	19,209.48	
10-115000	ACCOUNTS RECEIVABLE	298,753.18	
10-141000	PREPAID EXPENSES	3,067.37	
	TOTAL ASSETS		2,956,973.56

LIABILITIES AND EQUITY

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

GENERAL FUND

	LIABILITIES			
10-201000	ACCRUED SALARIES PAYABLE		35,705.16	
10-202000	ACCOUNTS PAYABLE		21,384.58	
10-202200	RESTITUTION PAYABLE--MUNI. CT.		2,295.19	
10-202201	COURT BONDS POSTED		590.00	
10-202202	OJW/WARRANT FEE DUE TO DMV		103.98	
10-202203	PERFORMANCE BONDS PAYABLE		65,714.39	
10-202300	AP TO ELBERT CO.--BLGUTX SHARE		56,053.44	
10-217100	FPPA CONTRIBUTIONS PAYABLE		6,361.54	
10-217200	SOC SEC TAXES PAYABLE		6,751.53	
10-217201	MEDICARE TAXES PAYABLE		2,408.48	
10-217300	FED'L WITHHOLDING TAXES PAYABL		8,322.41	
10-217400	STATE WITHHOLDING TAXES PAYABL		5,885.00	
10-217500	HEALTH INSURANCE PAYABLE		(265.96)	
10-217501	PRETAX SUPPLEMENTAL INSURANCE		74.49	
10-217502	AFTER TAX SUPPLEMENTAL INS		154.93	
10-217600	UNEMPLOYMENT INSURANCE PAYABLE		253.43	
10-217601	HEALTH SAVINGS PAYABLE		2,620.00	
10-217603	WORKERS' COMP. INS. PAYABLE		24,493.23	
10-217700	GARNISHMENT PAYABLE		348.99	
10-219000	457 CONTRIBUTIONS PAYABLE		2,967.65	
10-222001	DEFERRED REVENUE - ARPA		303,828.76	
10-250022	LENNAR		(17,749.22)	
10-250038	COUNTRYSIDE VILLAGE		(117.88)	
10-250039	SCARLETT CREEK SUBDIVISION		80.04	
10-250041	MAIN STREET STATION		259.21	
10-250042	ELIZABETH WEST ZONING		(18,487.75)	
10-250051	HENDERSON REPLAT		461.05	
10-250054	ZIGGI'S COFFEE		3,183.20	
10-250055	CLEARY BUILDING		(2,935.40)	
10-250056	MCDONALDS IGA		3,404.00	
10-250057	ANNA'S CAR WASH IGA		654.00	
10-250059	H1 ENTERPRISES		1,758.50	
10-250060	PINE RIDGE CROSSING (NEW)		(15,838.98)	
10-250061	LENNAR AT LEGACY VILLAGE		(16,444.66)	
10-250062	ELIZABETH STREET PLAZA		(6,607.92)	
10-250063	WALNUT GROVE		180.87	
10-250064	MBP ENTERPRISES INC.		1,812.00	
	TOTAL LIABILITIES			479,662.28
	FUND EQUITY			
10-280000	FUND BALANCE		2,431,544.59	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	45,766.69		
	BALANCE - CURRENT DATE		45,766.69	
	TOTAL FUND EQUITY			2,477,311.28
	TOTAL LIABILITIES AND EQUITY			2,956,973.56

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	TAX					
10-31-1000	CURRENT PROPERTY TAXES	12,442.72	12,442.72	750,000.00	737,557.28	1.7
10-31-2000	SPECIFIC OWNERSHIP TAX	7,015.61	7,015.61	115,000.00	107,984.39	6.1
10-31-3100	1% NON-TABOR SALES TAX	69,259.69	69,259.69	1,000,000.00	930,740.31	6.9
	TOTAL TAX	88,718.02	88,718.02	1,865,000.00	1,776,281.98	4.8
	LICENSES & PERMITS					
10-32-1000	FRANCHISE TAX	22,163.48	22,163.48	80,000.00	57,836.52	27.7
10-32-2000	BUILDING PERMIT	19,763.21	19,763.21	150,000.00	130,236.79	13.2
10-32-3000	OTHER LICENSES, FEES AND CHG	1,012.50	1,012.50	30,000.00	28,987.50	3.4
	TOTAL LICENSES & PERMITS	42,939.19	42,939.19	260,000.00	217,060.81	16.5
	INTERGOVERNMENTAL					
10-33-2000	CIGARETTE TAX	607.32	607.32	3,000.00	2,392.68	20.2
10-33-3000	CONSERVATION TRUST FUND	.00	.00	10,000.00	10,000.00	.0
	TOTAL INTERGOVERNMENTAL	607.32	607.32	13,000.00	12,392.68	4.7
	SOURCE 34					
10-34-1000	GRANTS	.00	.00	50,000.00	50,000.00	.0
	TOTAL SOURCE 34	.00	.00	50,000.00	50,000.00	.0
	EARMARKED FUNDS / MISCELLANEOU					
10-36-1000	INTEREST	11,076.16	11,076.16	8,000.00	(3,076.16)	138.5
10-36-3100	FINES AND FOREFEITURES	5,172.60	5,172.60	73,000.00	67,827.40	7.1
10-36-4000	PUBLIC IMPROVEMENT FEE	57,545.56	57,545.56	710,000.00	652,454.44	8.1
10-36-7000	POLICE REVENUE	173.00	173.00	35,000.00	34,827.00	.5
	TOTAL EARMARKED FUNDS / MISCELLANEOU	73,967.32	73,967.32	826,000.00	752,032.68	9.0
	OTHER FUNDS					
10-39-7000	TRANSFER FROM WATER FUND	14,583.33	14,583.33	175,000.00	160,416.67	8.3
10-39-7003	TRANSFER FROM CAP IMP FUND	4,583.33	4,583.33	55,000.00	50,416.67	8.3
10-39-7004	TRANSFER FROM STREET CAP FUND	4,166.67	4,166.67	50,000.00	45,833.33	8.3
	TOTAL OTHER FUNDS	23,333.33	23,333.33	280,000.00	256,666.67	8.3

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
TOTAL FUND REVENUE	229,565.18	229,565.18	3,294,000.00	3,064,434.82	7.0

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	TOWN CLERK					
10-41-1100	SALARIES & WAGES	13,931.96	13,931.96	189,000.00	175,068.04	7.4
10-41-1150	TOWN CLERK SALARY	7,403.39	7,403.39	96,800.00	89,396.61	7.7
10-41-1300	OVERTIME	32.65	32.65	.00	(32.65)	.0
10-41-1400	WORKERS' COMPENSATION	25.65	25.65	372.00	346.35	6.9
10-41-1500	HEALTH INSURANCE	5,799.09	5,799.09	58,000.00	52,200.91	10.0
10-41-1550	RETIREMENT	748.53	748.53	8,000.00	7,251.47	9.4
10-41-1600	FICA	1,597.34	1,597.34	21,864.00	20,266.66	7.3
10-41-1700	COLO UNEMPLOYMENT	42.72	42.72	857.00	814.28	5.0
10-41-1800	TUITION REIMBURSEMENT	.00	.00	10,000.00	10,000.00	.0
10-41-1825	MEMBERSHIPS - EMPLOYEE	.00	.00	1,500.00	1,500.00	.0
10-41-1850	TRAINING, TRAVEL AND LODGING	(563.29)	(563.29)	13,000.00	13,563.29	(4.3)
10-41-2500	AUDIT	.00	.00	28,000.00	28,000.00	.0
10-41-3000	COMMUNITY ENGAGEMENT	.00	.00	3,400.00	3,400.00	.0
10-41-3200	CONTRACTED SERVICES	.00	.00	5,000.00	5,000.00	.0
10-41-3320	CONTRIBUTIONS AND SPONSORSHIPS	.00	.00	3,000.00	3,000.00	.0
10-41-3350	COUNTY TREASURER & OTHER FEES	248.85	248.85	18,000.00	17,751.15	1.4
10-41-3400	LEGAL PUBLICATIONS	150.27	150.27	11,000.00	10,849.73	1.4
10-41-3450	ELECTIONS	.00	.00	25,000.00	25,000.00	.0
10-41-4000	BLDG MAINT AND REPAIRS	372.00	372.00	12,000.00	11,628.00	3.1
10-41-4400	EQUIPMENT AND MAINT	787.62	787.62	12,000.00	11,212.38	6.6
10-41-4500	FURNITURE	.00	.00	3,500.00	3,500.00	.0
10-41-4600	OFFICE SUPPLIES	148.39	148.39	11,000.00	10,851.61	1.4
10-41-4700	POSTAGE	469.47	469.47	15,500.00	15,030.53	3.0
10-41-4800	TELEPHONE AND INTERNET	1,062.25	1,062.25	15,500.00	14,437.75	6.9
10-41-4900	UTILITIES	1,039.02	1,039.02	8,000.00	6,960.98	13.0
10-41-5100	HUMAN RESOURCES - CONTRACTED	.00	.00	5,000.00	5,000.00	.0
10-41-5250	IT - CONTRACTED	2,247.43	2,247.43	33,000.00	30,752.57	6.8
10-41-5300	IT - HARDWARE	.00	.00	20,000.00	20,000.00	.0
10-41-5325	IT - SOFTWARE PURCHASES	.00	.00	2,000.00	2,000.00	.0
10-41-5350	IT - SOFTWARE CONTRACTS	9,486.00	9,486.00	45,000.00	35,514.00	21.1
10-41-5400	INSURANCE	75.21	75.21	116,000.00	115,924.79	.1
10-41-5500	LEGAL - CONTRACTED	.00	.00	60,000.00	60,000.00	.0
10-41-5600	MEMBERSHIPS - TOWN	.00	.00	13,000.00	13,000.00	.0
10-41-5700	PUBLIC RELATIONS	114.29	114.29	5,000.00	4,885.71	2.3
10-41-5800	TOWN HALL EVENTS	.00	.00	8,500.00	8,500.00	.0
10-41-9000	OTHER	660.02	660.02	7,500.00	6,839.98	8.8
	TOTAL TOWN CLERK	45,878.86	45,878.86	885,293.00	839,414.14	5.2

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	JUDICIAL					
10-42-1200	SALARIES & WAGES- MUNI JUDGE	719.26	719.26	15,000.00	14,280.74	4.8
10-42-1300	SALARIES & WAGES- ASST JUDGE	719.26	719.26	4,000.00	3,280.74	18.0
10-42-1400	STATE COMP	40.14	40.14	500.00	459.86	8.0
10-42-1600	FICA	110.04	110.04	1,500.00	1,389.96	7.3
10-42-1700	COLO UNEMPLOYMENT	2.88	2.88	60.00	57.12	4.8
10-42-1850	TRAINING, TRAVEL AND LODGING	.00	.00	2,600.00	2,600.00	.0
10-42-3200	COURT PROSECUTOR - CONTRACTED	.00	.00	12,000.00	12,000.00	.0
10-42-9000	OTHER	392.80	392.80	1,000.00	607.20	39.3
	TOTAL JUDICIAL	1,984.38	1,984.38	36,660.00	34,675.62	5.4
	LEGISLATURE					
10-43-1100	BOT - SALARIES & WAGES	1,200.00	1,200.00	14,400.00	13,200.00	8.3
10-43-1200	PC - COMPENSATION	250.00	250.00	3,600.00	3,350.00	6.9
10-43-1400	BOT - WORKERS' COMPENSATION	.77	.77	9.00	8.23	8.6
10-43-1450	PC - WORKERS' COMPENSATION	.00	.00	2.00	2.00	.0
10-43-1600	BOT - FICA	110.97	110.97	1,102.00	991.03	10.1
10-43-1650	PC - FICA	.00	.00	275.00	275.00	.0
10-43-1700	BOT - COLO UNEMPLOYMENT	2.90	2.90	43.00	40.10	6.7
10-43-1750	PC - COLO UNEMPLOYMENT	.00	.00	11.00	11.00	.0
10-43-1850	BOT - TRAIN, TRVL, LODG	.00	.00	8,000.00	8,000.00	.0
10-43-3700	PC - TRAIN, TRVL, LODG	.00	.00	4,000.00	4,000.00	.0
10-43-4400	BOT - EQUIPMENT	.00	.00	2,500.00	2,500.00	.0
10-43-4450	PC - EQUIPMENT	.00	.00	3,000.00	3,000.00	.0
10-43-5000	BOT - MEALS	.00	.00	2,000.00	2,000.00	.0
10-43-6000	PC - MEALS	.00	.00	250.00	250.00	.0
10-43-9000	BOT- OTHER	.00	.00	700.00	700.00	.0
	TOTAL LEGISLATURE	1,564.64	1,564.64	39,892.00	38,327.36	3.9

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	POLICE					
10-46-1100	SALARIES & WAGES	59,047.40	59,047.40	850,000.00	790,952.60	7.0
10-46-1240	CONTRACTED OVERTIME	.00	.00	8,000.00	8,000.00	.0
10-46-1300	OVERTIME	590.53	590.53	15,000.00	14,409.47	3.9
10-46-1400	WORKERS' COMPENSATION	1,533.86	1,533.86	24,324.00	22,790.14	6.3
10-46-1500	HEALTH INSURANCE	14,458.75	14,458.75	195,000.00	180,541.25	7.4
10-46-1550	RETIREMENT	1,020.03	1,020.03	10,000.00	8,979.97	10.2
10-46-1600	FICA	1,205.44	1,205.44	18,583.00	17,377.56	6.5
10-46-1605	FPPA	6,277.65	6,277.65	80,750.00	74,472.35	7.8
10-46-1700	COLO UNEMPLOYMENT	109.57	109.57	2,619.00	2,509.43	4.2
10-46-1825	MEMBERSHIPS - EMPLOYEE	.00	.00	1,500.00	1,500.00	.0
10-46-1850	TRAINING, TRAVEL AND LODGING	.00	.00	15,000.00	15,000.00	.0
10-46-3000	COMMUNITY OUTREACH	.00	.00	3,500.00	3,500.00	.0
10-46-3200	CONTRACTED SERVICES	6,695.48	6,695.48	75,000.00	68,304.52	8.9
10-46-3600	MOBILE DATA LAPTOPS	413.46	413.46	5,000.00	4,586.54	8.3
10-46-3650	WEAPONS - NON-LETHAL	.00	.00	6,000.00	6,000.00	.0
10-46-4000	BLDG MAINT & REPAIRS	.00	.00	21,000.00	21,000.00	.0
10-46-4300	DRUG, SCREEN, PSY & POLY TEST	.00	.00	4,000.00	4,000.00	.0
10-46-4400	EQUIPMENT AND MAINTENANCE	311.33	311.33	12,000.00	11,688.67	2.6
10-46-4500	FURNITURE	2,196.02	2,196.02	5,000.00	2,803.98	43.9
10-46-4650	OFFICE SUPPLILES	261.03	261.03	14,000.00	13,738.97	1.9
10-46-4700	POSTAGE	.00	.00	1,000.00	1,000.00	.0
10-46-4800	TELEPHONE & INTERNET	1,408.28	1,408.28	17,800.00	16,391.72	7.9
10-46-4900	UTILITIES	674.72	674.72	7,000.00	6,325.28	9.6
10-46-6400	TRAINING AND AMMUNITION	.00	.00	3,000.00	3,000.00	.0
10-46-6600	UNIFORMS	261.87	261.87	23,000.00	22,738.13	1.1
10-46-8050	VEHICLE MAINT & REPAIRS	972.16	972.16	27,500.00	26,527.84	3.5
10-46-8075	FUEL	30.44	30.44	20,000.00	19,969.56	.2
10-46-9000	OTHER	1,151.46	1,151.46	6,000.00	4,848.54	19.2
10-46-9050	VEHICLE DEPRECIATION	.00	.00	14,640.00	14,640.00	.0
	TOTAL POLICE	98,619.48	98,619.48	1,486,216.00	1,387,596.52	6.6

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	PUBLIC WORKS/PARKS/BUILDINGS					
10-49-1100	SALARIES & WAGES	4,335.48	4,335.48	54,856.00	50,520.52	7.9
10-49-1300	OVERTIME	273.14	273.14	4,200.00	3,926.86	6.5
10-49-1400	WORKERS' COMPENSATION	157.76	157.76	2,300.00	2,142.24	6.9
10-49-1500	HEALTH INSURANCE	999.41	999.41	11,000.00	10,000.59	9.1
10-49-1550	RETIREMENT	89.53	89.53	2,000.00	1,910.47	4.5
10-49-1600	FICA	346.22	346.22	4,518.00	4,171.78	7.7
10-49-1700	COLO UNEMPLOYMENT	9.21	9.21	177.00	167.79	5.2
10-49-1850	TRAINING, TRAVEL AND LODGING	.00	.00	150.00	150.00	.0
10-49-4000	BLDG MAINT & REPAIRS	.00	.00	20,000.00	20,000.00	.0
10-49-4800	TELEPHONE AND CELLPHONES	87.02	87.02	4,800.00	4,712.98	1.8
10-49-4900	UTILITIES	517.35	517.35	8,000.00	7,482.65	6.5
10-49-6100	PARKS MAINTENANCE	(87.29)	(87.29)	35,000.00	35,087.29	(.3)
10-49-6300	PARTS AND REPAIRS	.00	.00	8,000.00	8,000.00	.0
10-49-6500	TREE CITY USA	.00	.00	2,500.00	2,500.00	.0
10-49-6600	UNIFORMS	.00	.00	840.00	840.00	.0
10-49-8050	VEHICLE MAINT & REPAIRS	.00	.00	3,000.00	3,000.00	.0
10-49-8075	FUEL	40.96	40.96	3,000.00	2,959.04	1.4
10-49-8080	DIESEL	6.80	6.80	1,200.00	1,193.20	.6
10-49-9000	OTHER	(37.17)	(37.17)	2,500.00	2,537.17	(1.5)
10-49-9050	VEHICLE DEPRECIATION	.00	.00	2,448.00	2,448.00	.0
	TOTAL PUBLIC WORKS/PARKS/BUILDINGS	6,738.42	6,738.42	170,489.00	163,750.58	4.0
	TWN ADMINSTR					
10-52-1100	SALARIES & WAGES	12,910.64	12,910.64	160,500.00	147,589.36	8.0
10-52-1400	WORKERS' COMPENSATION	15.50	15.50	193.00	177.50	8.0
10-52-1500	HEALTH INSURANCE	.00	.00	13,000.00	13,000.00	.0
10-52-1550	RETIREMENT	.00	.00	4,500.00	4,500.00	.0
10-52-1600	FICA	991.48	991.48	12,278.00	11,286.52	8.1
10-52-1700	COLO UNEMPLOYMENT	25.83	25.83	482.00	456.17	5.4
10-52-1850	TRAINING, TRAVEL AND LODGING	.00	.00	2,500.00	2,500.00	.0
10-52-1900	ALLOWANCES	50.00	50.00	3,900.00	3,850.00	1.3
10-52-3900	CELL PHONES	.00	.00	1,200.00	1,200.00	.0
	TOTAL TWN ADMINSTR	13,993.45	13,993.45	198,553.00	184,559.55	7.1

GENERAL FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	COMM DEV					
10-53-1100	SALARIES & WAGES- COMM DEV	9,737.24	9,737.24	226,000.00	216,262.76	4.3
10-53-1300	OVERTIME COMMUNITY DEVELOPMENT	103.50	103.50	500.00	396.50	20.7
10-53-1400	WORKERS' COMPENSATION	11.69	11.69	271.00	259.31	4.3
10-53-1500	HEALTH INSURANCE	3,585.74	3,585.74	34,000.00	30,414.26	10.6
10-53-1550	RETIREMENT	289.36	289.36	7,000.00	6,710.64	4.1
10-53-1600	FICA	719.22	719.22	17,289.00	16,569.78	4.2
10-53-1700	COLO UNEMPLOYMENT	19.51	19.51	680.00	660.49	2.9
10-53-1825	MEMBERSHIPS - EMPLOYEE	.00	.00	1,400.00	1,400.00	.0
10-53-1850	TRAINING, TRAVEL AND LODGING	.00	.00	7,000.00	7,000.00	.0
10-53-2500	COMMUNITY EVENTS	553.00	553.00	60,000.00	59,447.00	.9
10-53-3000	BUILDING PERMITS	.00	.00	115,000.00	115,000.00	.0
10-53-3200	CONTRACTED SERVICES	.00	.00	30,000.00	30,000.00	.0
10-53-3425	ELIZABETH MAIN STREET	.00	.00	33,000.00	33,000.00	.0
10-53-3450	HISTORIC ADVISORY BOARD	.00	.00	37,000.00	37,000.00	.0
10-53-3475	MARKETING MATERIALS & PUBL	.00	.00	5,000.00	5,000.00	.0
10-53-3900	CELL PHONE	.00	.00	1,000.00	1,000.00	.0
10-53-4000	GIS	.00	.00	800.00	800.00	.0
10-53-4400	EQUIPMENT AND MAINTENANCE	.00	.00	1,500.00	1,500.00	.0
10-53-4500	FURNITURE	.00	.00	750.00	750.00	.0
10-53-4600	OFFICE SUPPLIES	.00	.00	2,000.00	2,000.00	.0
10-53-4700	POSTAGE	.00	.00	2,500.00	2,500.00	.0
10-53-9000	OTHER	.00	.00	500.00	500.00	.0
	TOTAL COMM DEV	15,019.26	15,019.26	583,190.00	568,170.74	2.6
	TOTAL FUND EXPENDITURES	183,798.49	183,798.49	3,400,293.00	3,216,494.51	5.4
	NET REVENUE OVER EXPENDITURES	45,766.69	45,766.69	(106,293.00)	(152,059.69)	43.1

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

STREET FUND

	ASSETS			
21-100001	CASH IN COMBINED CASH FUND		950,499.09	
21-115000	ACCOUNTS RECEIVABLE		35,057.22	
	TOTAL ASSETS			985,556.31
	LIABILITIES AND EQUITY			
	LIABILITIES			
21-201000	ACCRUED SALARIES PAYABLE		8,603.68	
21-202000	ACCOUNTS PAYABLE		10,673.00	
	TOTAL LIABILITIES			19,276.68
	FUND EQUITY			
21-280000	FUND BALANCE		965,344.99	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	934.64		
	BALANCE - CURRENT DATE		934.64	
	TOTAL FUND EQUITY			966,279.63
	TOTAL LIABILITIES AND EQUITY			985,556.31

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

STREET FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	TAXES					
21-31-3000	GENERAL SALES TAX	10,388.95	10,388.95	150,000.00	139,611.05	6.9
21-31-4000	USE TAX	2,334.78	2,334.78	10,000.00	7,665.22	23.4
	TOTAL TAXES	12,723.73	12,723.73	160,000.00	147,276.27	8.0
	INTERGOVERMENT					
21-33-1000	HIGHWAY USERS TAX	5,701.78	5,701.78	60,000.00	54,298.22	9.5
21-33-1050	ROAD & BRIDGE	.00	.00	150,000.00	150,000.00	.0
21-33-6100	M.V. REGISTRATION ($1.50)	226.18	226.18	5,000.00	4,773.82	4.5
21-33-6200	M.V. REGISTRATION ($2.50)	335.00	335.00	7,200.00	6,865.00	4.7
	TOTAL INTERGOVERMENT	6,262.96	6,262.96	222,200.00	215,937.04	2.8
	OTHER SOURCES OF REVENUE					
21-36-1000	INVESTMENT INCOME	3,807.57	3,807.57	4,000.00	192.43	95.2
21-36-4000	PUBLIC IMPROVEMENT FEE	1,718.66	1,718.66	22,000.00	20,281.34	7.8
	TOTAL OTHER SOURCES OF REVENUE	5,526.23	5,526.23	26,000.00	20,473.77	21.3
	TOTAL FUND REVENUE	24,512.92	24,512.92	408,200.00	383,687.08	6.0

TOWN OF ELIZABETH
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

STREET FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	STREETS					
21-49-1100	SALARIES & WAGES- PUB WORKS	13,006.43	13,006.43	164,567.00	151,560.57	7.9
21-49-1300	OVERTIME	819.42	819.42	13,000.00	12,180.58	6.3
21-49-1400	WORKERS' COMPENSATION	471.79	471.79	6,900.00	6,428.21	6.8
21-49-1500	HEALTH INSURANCE	2,998.24	2,998.24	38,000.00	35,001.76	7.9
21-49-1550	RETIREMENT	268.62	268.62	5,000.00	4,731.38	5.4
21-49-1600	FICA	1,038.70	1,038.70	13,584.00	12,545.30	7.7
21-49-1700	COLO UNEMPLOYMENT	27.64	27.64	533.00	505.36	5.2
21-49-1900	ALLOWANCES	78.75	78.75	.00	(78.75)	.0
21-49-3200	CONTRACTED SERVICES	1,742.48	1,742.48	70,000.00	68,257.52	2.5
21-49-3500	DE-ICING SUPPLIES	.00	.00	7,500.00	7,500.00	.0
21-49-3650	LIGHTS AND SIGNALS	82.92	82.92	18,000.00	17,917.08	.5
21-49-4000	MAINTENANCE AND REPAIRS	511.46	511.46	100,000.00	99,488.54	.5
21-49-4800	PHONES	.00	.00	2,700.00	2,700.00	.0
21-49-5800	ROW MAINTENANCE	2,500.00	2,500.00	105,000.00	102,500.00	2.4
21-49-6100	SIGNS	.00	.00	21,500.00	21,500.00	.0
21-49-6600	UNIFORMS	.00	.00	2,520.00	2,520.00	.0
21-49-8050	VEHICLE MAINT & REPAIRS	.00	.00	9,000.00	9,000.00	.0
21-49-8075	FUEL	122.96	122.96	9,000.00	8,877.04	1.4
21-49-8080	DIESEL	20.39	20.39	3,600.00	3,579.61	.6
21-49-9000	OTHER	(111.52)	(111.52)	500.00	611.52	(22.3)
21-49-9050	VEHICLE DEPRECIATION	.00	.00	7,344.00	7,344.00	.0
	TOTAL STREETS	23,578.28	23,578.28	598,248.00	574,669.72	3.9
	TOTAL FUND EXPENDITURES	23,578.28	23,578.28	598,248.00	574,669.72	3.9
	NET REVENUE OVER EXPENDITURES	934.64	934.64	(190,048.00)	(190,982.64)	.5

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

CAPITAL IMPROVEMENT FUND

	ASSETS			
31-100001	CASH IN COMBINED CASH FUND		8,559,690.61	
31-115000	ACCOUNTS RECEIVABLE		248,533.14	
	TOTAL ASSETS			8,808,223.75
	LIABILITIES AND EQUITY			
	LIABILITIES			
31-202000	ACCOUNTS PAYABLE		5,495.00	
	TOTAL LIABILITIES			5,495.00
	FUND EQUITY			
31-280000	FUND BALANCE		8,635,236.16	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	167,492.59		
	BALANCE - CURRENT DATE		167,492.59	
	TOTAL FUND EQUITY			8,802,728.75
	TOTAL LIABILITIES AND EQUITY			8,808,223.75

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

CAPITAL IMPROVEMENT FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	TAX					
31-31-3000	SALES TAX	103,889.53	103,889.53	1,500,000.00	1,396,110.47	6.9
31-31-4000	USE TAX	23,347.81	23,347.81	150,000.00	126,652.19	15.6
	TOTAL TAX	127,237.34	127,237.34	1,650,000.00	1,522,762.66	7.7
	OTHER FINANCING SOURCES					
31-36-1000	INVESTMENT INCOME	35,171.08	35,171.08	15,000.00	(20,171.08)	234.5
31-36-9000	OTHER REVENUE	9,667.50	9,667.50	50,000.00	40,332.50	19.3
	TOTAL OTHER FINANCING SOURCES	44,838.58	44,838.58	65,000.00	20,161.42	69.0
	TOTAL FUND REVENUE	172,075.92	172,075.92	1,715,000.00	1,542,924.08	10.0

TOWN OF ELIZABETH
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

CAPITAL IMPROVEMENT FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	CAPITAL IMPROVEMENT MISC					
31-80-0100	LAND PURCHASE	.00	.00	250,000.00	250,000.00	.0
31-80-0600	RUNNING CREEK PARK	.00	.00	119,900.00	119,900.00	.0
31-80-3400	FACILITIES MASTER PLAN	.00	.00	75,000.00	75,000.00	.0
31-80-3450	SENIOR CENTER	.00	.00	450,000.00	450,000.00	.0
31-80-4000	EQUIPMENT	.00	.00	15,000.00	15,000.00	.0
31-80-4005	HYDRO-VAC TRAILER	.00	.00	22,500.00	22,500.00	.0
31-80-4010	WHEELED TIRE LOADER (USED)	.00	.00	37,500.00	37,500.00	.0
31-80-4015	PW TRUCKS	.00	.00	111,290.00	111,290.00	.0
31-80-5500	TOWN HALL BLDG IMPROVEMENTS	.00	.00	100,000.00	100,000.00	.0
31-80-5505	PD BUILDING IMPROVEMENTS	.00	.00	75,000.00	75,000.00	.0
31-80-5510	BANNER & ELM PROPERTY	.00	.00	150,000.00	150,000.00	.0
31-80-5515	COMMUNITY GARDEN	.00	.00	25,000.00	25,000.00	.0
31-80-6000	PLAYGROUND UPGRADES	.00	.00	65,000.00	65,000.00	.0
31-80-6500	TRAIL SYSTEMS	.00	.00	4,500.00	4,500.00	.0
31-80-9100	TOWN HALL LANDSCAPING	.00	.00	5,000.00	5,000.00	.0
31-80-9900	TRANSFER TO WATER FUND	.00	.00	3,500.00	3,500.00	.0
31-80-9901	TRANSFER TO GENERAL FUND	4,583.33	4,583.33	55,000.00	50,416.67	8.3
	TOTAL CAPITAL IMPROVEMENT MISC	4,583.33	4,583.33	1,564,190.00	1,559,606.67	.3
	TOTAL FUND EXPENDITURES	4,583.33	4,583.33	1,564,190.00	1,559,606.67	.3
	NET REVENUE OVER EXPENDITURES	167,492.59	167,492.59	150,810.00	(16,682.59)	111.1

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

STREET CAPITAL IMPROVEMENT FND

	ASSETS			
32-100001	CASH IN COMBINED CASH FUND		3,056,524.72	
32-104400	STREET BOND RESERVE CD ACCOUNT		256,024.93	
32-115000	ACCOUNTS RECEIVABLE		223,679.82	
	TOTAL ASSETS			3,536,229.47
	LIABILITIES AND EQUITY			
	LIABILITIES			
32-202000	ACCOUNTS PAYABLE		29,213.58	
32-203000	RETAINAGE PAYABLE		150,934.90	
32-222000	DEFERRED REVENUE		11,500.00	
	TOTAL LIABILITIES			191,648.48
	FUND EQUITY			
32-280000	FUND BALANCE		3,224,122.12	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	120,458.87		
	BALANCE - CURRENT DATE		120,458.87	
	TOTAL FUND EQUITY			3,344,580.99
	TOTAL LIABILITIES AND EQUITY			3,536,229.47

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

STREET CAPITAL IMPROVEMENT FND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	TAX					
32-31-3000	GENERAL SALES TAX	93,500.57	93,500.57	1,350,000.00	1,256,499.43	6.9
32-31-4000	USE TAX	21,013.02	21,013.02	192,000.00	170,986.98	10.9
	TOTAL TAX	114,513.59	114,513.59	1,542,000.00	1,427,486.41	7.4
	OTHER FINANCING SOURCES					
32-36-1000	INVESTMENT INCOME	13,136.95	13,136.95	10,000.00	(3,136.95)	131.4
	TOTAL OTHER FINANCING SOURCES	13,136.95	13,136.95	10,000.00	(3,136.95)	131.4
	TOTAL FUND REVENUE	127,650.54	127,650.54	1,552,000.00	1,424,349.46	8.2

TOWN OF ELIZABETH
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

STREET CAPITAL IMPROVEMENT FND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	CAPITAL OUTLAY					
32-49-6600	RIGHT OF WAY EASEMENTS	.00	.00	35,000.00	35,000.00	.0
32-49-8000	STREET PAVING	.00	.00	160,000.00	160,000.00	.0
32-49-9000	CONCRETE STREET REPAIRS	.00	.00	310,000.00	310,000.00	.0
32-49-9100	EQUIPMENT	.00	.00	300,000.00	300,000.00	.0
32-49-9101	ROTOMILL	.00	.00	1,400,000.00	1,400,000.00	.0
32-49-9105	HYDRO-VAC TRAILER	.00	.00	22,500.00	22,500.00	.0
32-49-9110	WHEELED TIRE LOADER (USED)	.00	.00	37,500.00	37,500.00	.0
32-49-9200	CURB & GUTTER WORK	.00	.00	20,000.00	20,000.00	.0
32-49-9300	SIDEWALK REPLACEMENT PROGRAM	.00	.00	40,000.00	40,000.00	.0
32-49-9305	MAIN ST STREETSCAPE DESIGN	3,025.00	3,025.00	175,000.00	171,975.00	1.7
32-49-9310	TRANSFER TO GENERAL FUND	4,166.67	4,166.67	50,000.00	45,833.33	8.3
	TOTAL CAPITAL OUTLAY	7,191.67	7,191.67	2,550,000.00	2,542,808.33	.3
	DEBT SVC					
32-59-4000	PAYING AGENCY FEE	.00	.00	600.00	600.00	.0
32-59-9800	2015 REFUNDING BOND PRINCIPAL	.00	.00	440,000.00	440,000.00	.0
32-59-9850	2015 REFUNDING BOND INTEREST	.00	.00	66,263.00	66,263.00	.0
	TOTAL DEBT SVC	.00	.00	506,863.00	506,863.00	.0
	TOTAL FUND EXPENDITURES	7,191.67	7,191.67	3,056,863.00	3,049,671.33	.2
	NET REVENUE OVER EXPENDITURES	120,458.87	120,458.87	(1,504,863.00)	(1,625,321.87)	8.0

TOWN OF ELIZABETH
BALANCE SHEET
JANUARY 31, 2023

WATER SEWER FUND

	ASSETS			
52-100001	CASH IN COMBINED CASH FUND		4,573,096.73	
52-101000	PETTY CASH		100.00	
52-110000	ACCOUNTS RECEIVABLE: UB		135,860.80	
52-115000	ACCOUNTS RECEIVABLE:OTHER		3,389.48	
52-140000	PREPAID EXPENSES		413.27	
52-160100	LAND: WATER		171,737.60	
52-160200	LAND: SEWER		143,729.50	
52-161100	EASEMENTS: WATER		10,890.77	
52-161200	EASEMENTS: SEWER		32,271.26	
52-162100	PLANT & EQUIPMENT: WATER		2,271,315.79	
52-162200	PLANT & EQUIPMENT: SEWER		6,013,924.47	
52-163100	WATER IMPROVEMENTS		2,288,597.77	
52-163200	SEWER IMPROVEMENTS		2,727,573.38	
52-165100	CONSTRUCTION IN PROGRESS: WTR		2,995,509.36	
52-165200	CONSTRUCTION IN PROGRESS: SWR		73,176.80	
52-169100	ACCUMULATED DEP: WATER		(2,856,813.48)	
52-169200	ACCUMULATED DEP: SEWER		(4,109,283.34)	
	TOTAL ASSETS			14,475,490.16
	LIABILITIES AND EQUITY			
	LIABILITIES			
52-201000	ACCRUED SALARIES PAYABLE		17,207.34	
52-202000	ACCOUNTS PAYABLE		24,123.73	
52-203000	RETAINAGE PAYABLE		24,515.00	
52-215200	ACCRUED INT PAY: SEWER		2,103.20	
52-218000	COMPENSATED ABSENCES PAYABLE		14,582.02	
52-218100	COMP ABSENCES- CURRENT PAYABLE		1,458.20	
52-220000	CUSTOMER METER DEPOSITS		46,736.56	
52-231200	2007 CWRPDA CUR NOTES PAYABLE		62,396.58	
52-239402	2007 CWRPDA NOTE PAYABLE		275,161.86	
	TOTAL LIABILITIES			468,284.49
	FUND EQUITY			
52-280000	RETAINED EARNINGS		13,779,786.34	
	UNAPPROPRIATED FUND BALANCE:			
	REVENUE OVER EXPENDITURES - YTD	227,419.33		
	BALANCE - CURRENT DATE		227,419.33	
	TOTAL FUND EQUITY			14,007,205.67
	TOTAL LIABILITIES AND EQUITY			14,475,490.16

TOWN OF ELIZABETH
REVENUES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

WATER SEWER FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	CHARGE FOR SERVICES / TAP FEES					
52-34-4100	WATER SALES	54,698.33	54,698.33	750,000.00	695,301.67	7.3
52-34-4200	SEWER SALES	64,299.89	64,299.89	680,000.00	615,700.11	9.5
52-34-8100	WATER TAP FEES	73,600.00	73,600.00	250,000.00	176,400.00	29.4
52-34-8200	SEWER TAP FEES	73,600.00	73,600.00	450,000.00	376,400.00	16.4
	TOTAL CHARGE FOR SERVICES / TAP FEES	266,198.22	266,198.22	2,130,000.00	1,863,801.78	12.5
	MISCELLANEOUS					
52-36-1000	INVESTMENT INCOME	18,601.71	18,601.71	10,000.00	(8,601.71)	186.0
52-36-9000	OTHER REVENUE	12,572.64	12,572.64	70,000.00	57,427.36	18.0
	TOTAL MISCELLANEOUS	31,174.35	31,174.35	80,000.00	48,825.65	39.0
	TOTAL FUND REVENUE	297,372.57	297,372.57	2,210,000.00	1,912,627.43	13.5

TOWN OF ELIZABETH
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 1 MONTHS ENDING JANUARY 31, 2023

WATER SEWER FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	WATER					
52-57-1100	SALARIES & WAGES- WATER	13,006.43	13,006.43	164,567.00	151,560.57	7.9
52-57-1300	OVERTIME	819.42	819.42	13,000.00	12,180.58	6.3
52-57-1400	WORKERS' COMPENSATION	471.79	471.79	6,900.00	6,428.21	6.8
52-57-1500	HEALTH INSURANCE	2,998.24	2,998.24	38,000.00	35,001.76	7.9
52-57-1550	RETIREMENT	268.62	268.62	5,000.00	4,731.38	5.4
52-57-1600	FICA	1,038.70	1,038.70	165,561.00	164,522.30	.6
52-57-1700	COLO UNEMPLOYMENT	27.64	27.64	533.00	505.36	5.2
52-57-1825	MEMBERSHIPS - EMPLOYEE	.00	.00	900.00	900.00	.0
52-57-1850	TRAINING, TRAVEL AND LODGING	.00	.00	1,325.00	1,325.00	.0
52-57-1900	ALLOWANCES	78.75	78.75	.00	(78.75)	.0
52-57-3200	CONTRACTED SERVICES	47.00	47.00	160,000.00	159,953.00	.0
52-57-4800	TELEPHONE AND CELLPHONES	.00	.00	2,700.00	2,700.00	.0
52-57-4900	UTILITIES	9,349.91	9,349.91	100,000.00	90,650.09	9.4
52-57-5400	INSURANCE	.00	.00	11,000.00	11,000.00	.0
52-57-5500	LEGAL - CONTRACTED	.00	.00	7,500.00	7,500.00	.0
52-57-6000	MAINTENANCE AND REPAIRS	(87.29)	(87.29)	150,000.00	150,087.29	(.1)
52-57-6600	UNIFORMS	.00	.00	2,500.00	2,500.00	.0
52-57-7500	CHEMICAL SUPPLIES	2,848.80	2,848.80	18,000.00	15,151.20	15.8
52-57-7550	WATER SUPPLIES	.00	.00	15,000.00	15,000.00	.0
52-57-8050	VEHICLE MAINT & REPAIRS	.00	.00	9,000.00	9,000.00	.0
52-57-8075	FUEL	122.96	122.96	9,000.00	8,877.04	1.4
52-57-8080	DIESEL	20.39	20.39	3,600.00	3,579.61	.6
52-57-9000	OTHER	(111.52)	(111.52)	2,000.00	2,111.52	(5.6)
52-57-9050	VEHICLE DEPRECIATION	.00	.00	7,344.00	7,344.00	.0
52-57-9100	RITORO WELLS	.00	.00	1,300,000.00	1,300,000.00	.0
52-57-9900	WATER LINE UPGRADE	.00	.00	85,000.00	85,000.00	.0
	TOTAL WATER	30,899.84	30,899.84	2,278,430.00	2,247,530.16	1.4

WATER SEWER FUND

		PERIOD ACTUAL	YTD ACTUAL	BUDGET	OVER/UNDER BU	PCNT
	SEWER					
52-58-1100	-SALARIES & WAGES- SEWER	13,006.39	13,006.39	164,567.00	151,560.61	7.9
52-58-1300	OVERTIME	819.42	819.42	13,000.00	12,180.58	6.3
52-58-1400	WORKERS' COMPENSATION	471.79	471.79	6,900.00	6,428.21	6.8
52-58-1500	HEALTH INSURANCE	2,998.20	2,998.20	38,000.00	35,001.80	7.9
52-58-1550	RETIREMENT	268.67	268.67	5,000.00	4,731.33	5.4
52-58-1600	FICA	1,038.69	1,038.69	13,584.00	12,545.31	7.7
52-58-1700	COLO UNEMPLOYMENT	36.08	36.08	533.00	496.92	6.8
52-58-1825	MEMBERSHIPS - EMPLOYEE	.00	.00	900.00	900.00	.0
52-58-1850	TRAINING, TRAVEL AND LODGING	.00	.00	1,325.00	1,325.00	.0
52-58-1900	ALLOWANCES	78.75	78.75	.00	(78.75)	.0
52-58-3200	CONTRACTED SERVICES	284.67	284.67	90,000.00	89,715.33	.3
52-58-4800	TELEPHONE AND CELLPHONES	126.00	126.00	10,700.00	10,574.00	1.2
52-58-4900	UTILITIES	5,396.86	5,396.86	70,000.00	64,603.14	7.7
52-58-5400	INSURANCE	.00	.00	15,400.00	15,400.00	.0
52-58-6000	MAINTENANCE AND REPAIRS	(87.29)	(87.29)	130,000.00	130,087.29	(.1)
52-58-6610	UNIFORMS	.00	.00	2,500.00	2,500.00	.0
52-58-7500	SEWER SUPPLLIES	.00	.00	5,000.00	5,000.00	.0
52-58-8050	VEHICLE MAINT & REPAIRS	.00	.00	9,000.00	9,000.00	.0
52-58-8075	FUEL	122.96	122.96	9,000.00	8,877.04	1.4
52-58-8080	DIESEL	20.39	20.39	3,600.00	3,579.61	.6
52-58-9000	OTHER	(111.51)	(111.51)	5,000.00	5,111.51	(2.2)
52-58-9050	VEHICLE DEPRECIATION	.00	.00	7,344.00	7,344.00	.0
52-58-9400	WTP UPGRADES	.00	.00	950,000.00	950,000.00	.0
	TOTAL SEWER	24,470.07	24,470.07	1,551,353.00	1,526,882.93	1.6
	2007 CWRPDA					
52-63-6300	2007 CWRPDA PYMT- PRINCIPAL	.00	.00	62,398.00	62,398.00	.0
52-63-6400	2007 CWRPDA- INTEREST	.00	.00	12,100.00	12,100.00	.0
	TOTAL 2007 CWRPDA	.00	.00	74,498.00	74,498.00	.0
	DEPARTMENT 65					
52-65-9900	TRANSFER TO GENERAL FUND	14,583.33	14,583.33	175,000.00	160,416.67	8.3
	TOTAL DEPARTMENT 65	14,583.33	14,583.33	175,000.00	160,416.67	8.3
	TOTAL FUND EXPENDITURES	69,953.24	69,953.24	4,079,281.00	4,009,327.76	1.7
	NET REVENUE OVER EXPENDITURES	227,419.33	227,419.33	(1,869,281.00)	(2,096,700.33)	12.2

TOWN OF ELIZABETH

POLICE DEPARTMENT
JEFF ENGEL, INTERIM CHIEF OF POLICE

Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

ELIZABETH POLICE DEPARTMENT'S MISSION STATEMENT:

"To provide a leadership role in creating an atmosphere of safety and community pride in the Town of Elizabeth by providing quality law enforcement services which utilize innovative approaches to address community needs".

The following is an informational breakdown of EPD police activity from **03/05/2023 at 12:01 a.m. to 03/18/2023 at 11:59 p.m.** This information is compiled from our Records Management System (RMS), identified as New World (NW), as well as Douglas County Regional Dispatch (DRDC) records.

All suspects/defendants are presumed innocent until proven guilty in a Court of Law.

Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

Total Calls for Service:

318

Traffic Stops:

Total Stops:	Penalty Assessments:	Written Warnings:	Verbal Warnings:	Assisting Other Agencies
52	24	11	14	3

Parking Violations:

Total Parking Violations:	Parking Citations:	Parking Written Warnings:	Parking Verbal Warnings:
5	0	2	3

Other Calls for Service:

Call Type:	Number of Calls:
Alarm-Business Hold up	3
Animal Barking	1
Animal Complaint	1
Assault	1
Assist Fire	1
Attempt to Contact	1
Bar Check	2
Business Check	21
Citizen Assist	4
Citizen Contact	2
Crime Prevention	4
Criminal Mischief	1

Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

Dead Animal	1
Fight	1
Follow Up	3
Found Property	2
Fraud	1
Harassment	2
House Watch	2
Increased Patrol	119
Informational Report	3
Medical Assist	7
Mental Health Hold	1
Motorist Assist	1
Municipal Ordinance Violation	6
Motor Vehicle Accident Property Damage	1
Park Check	2
Parking Complaint	5
Report Every Drunk Driver Immediately	1
Runaway	1
School Education	17
Sex Offense	2
Shots Heard	1
Suspicious Circumstance	4
Suspicious Vehicle	24
Theft	1
Traffic Complaint	1
Traffic Hazard	4
Traffic Stop	52
VIN Verify	5
Warrant Pickup	1
Welfare Check	5

Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

Open and Active Investigations:

Case/Incident Number:	Call Type:	Details:
23-0666	Burglary	Investigation into a possible burglary at a local business.
23-1169	Financial Crimes	Investigation regarding wire fraud.
23-1362	Criminal Mischief	Investigation into vandalism of a building.

Please note that limited information regarding open investigations is available. This is to protect the integrity of the investigations.

Closed Case/Incident Reports:

Case/Incident Number:	Call Type:	Details:
23-0638	Animal Control	EPD responded to a report of several animals at large. EPD made contact with the owner of the animals, who had since secured them. EPD issued a warning to the owner.
23-0863	Sign Code	EPD Community Services located several signs that were posted on public utility poles. EPD Community Services worked with the owner of the signs to have them removed. The owner was issued a warning and given a copy of the sign code.
23-1020	Assist to Other Agency	EPD responded to assist ECSO on a possible theft that was occurring at a business. EPD turned the scene over to ECSO upon their arrival.
23-0520	Financial Crimes	EPD concluded an investigation into a possible fraud that had occurred at a business. The investigation concluded the matter was civil in nature.

Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

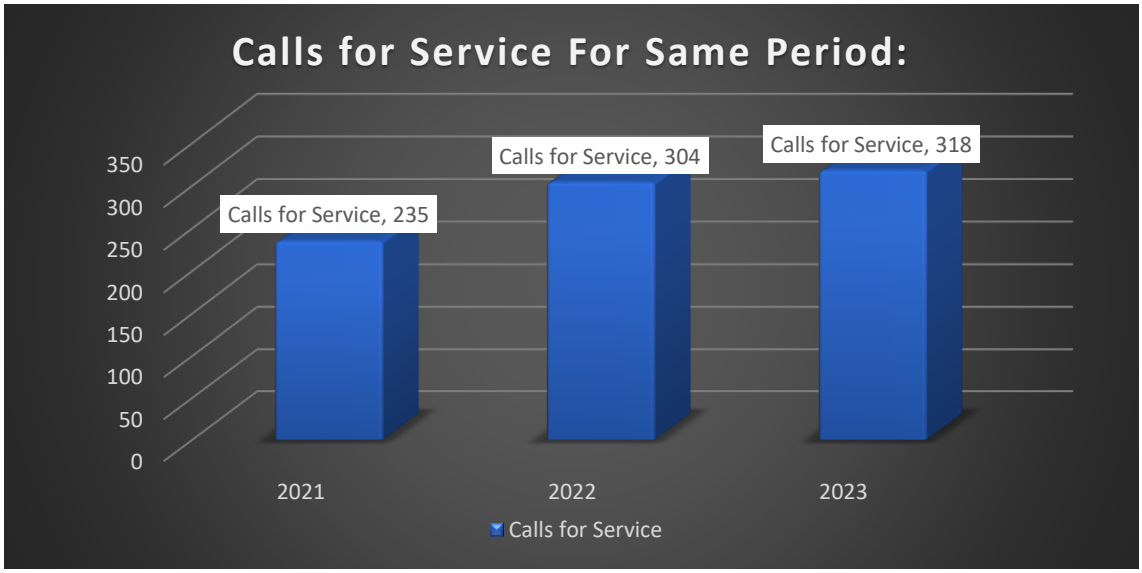
23-1126	Theft	EPD responded to a report of stolen license plates at a business. After investigation, no suspect was identified.
23-1307	Mental Health Hold	EPD responded to a local school on report of a student experiencing a mental health crisis. It was determined the student needed to be placed on a mental health hold. The juvenile was transported to a mental health facility.
23-1062	Sign Code	EPD Community Services located a sign that was posted illegally. Being unable to contact the owner, the sign was discarded.
23-1318	Motor Vehicle Accident	EPD responded to a two-vehicle crash. The at fault driver was issued a municipal summons for a traffic offense.
23-0870	Municipal Ordinance Violation	EPD concluded an investigation into a business that was operating without a proper license or zoning. EPD worked with Town staff to ensure the business did not continue operations without first obtaining the necessary permits. The owner was notified and has since ceased operations.
23-1281	Minor in Possession of Nicotine	EPD responded to a local school on report of a juvenile with a nicotine vape. As this was the students 1st offense, the juvenile was referred to the 2nd chance program. The student was turned over to the school for discipline.
23-1195	Minor in Possession of Nicotine	EPD responded to a local school on report of a juvenile with a nicotine vape. As this was the student's 2nd offense, a municipal summons was issued to the student.
23-0398	Theft	EPD responded to a local store on report of a theft. Upon investigation, no suspect was identified, and the case was closed.

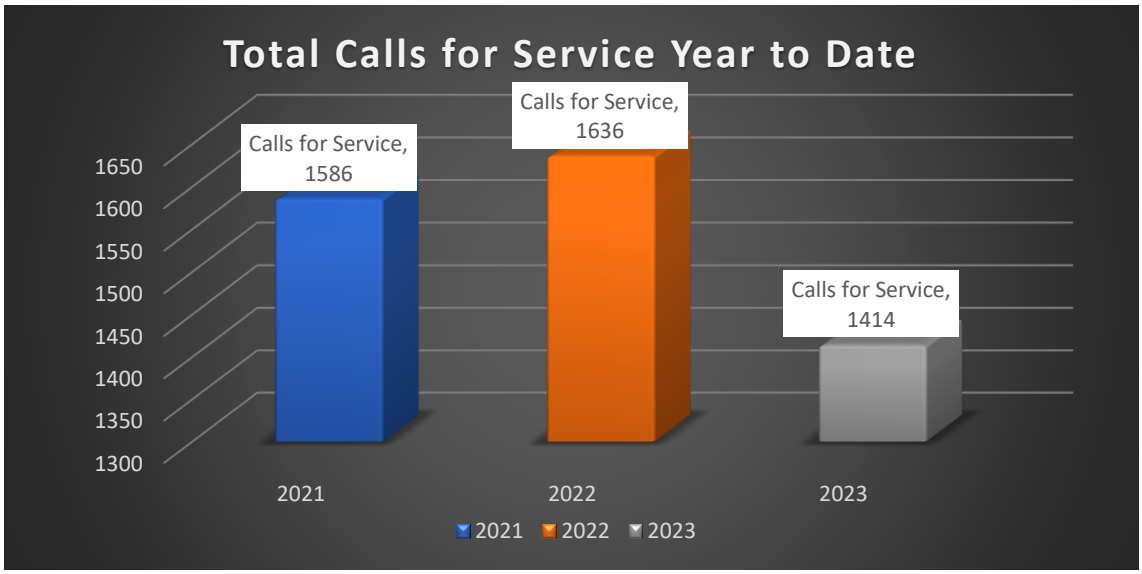
Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023

Historical Data:

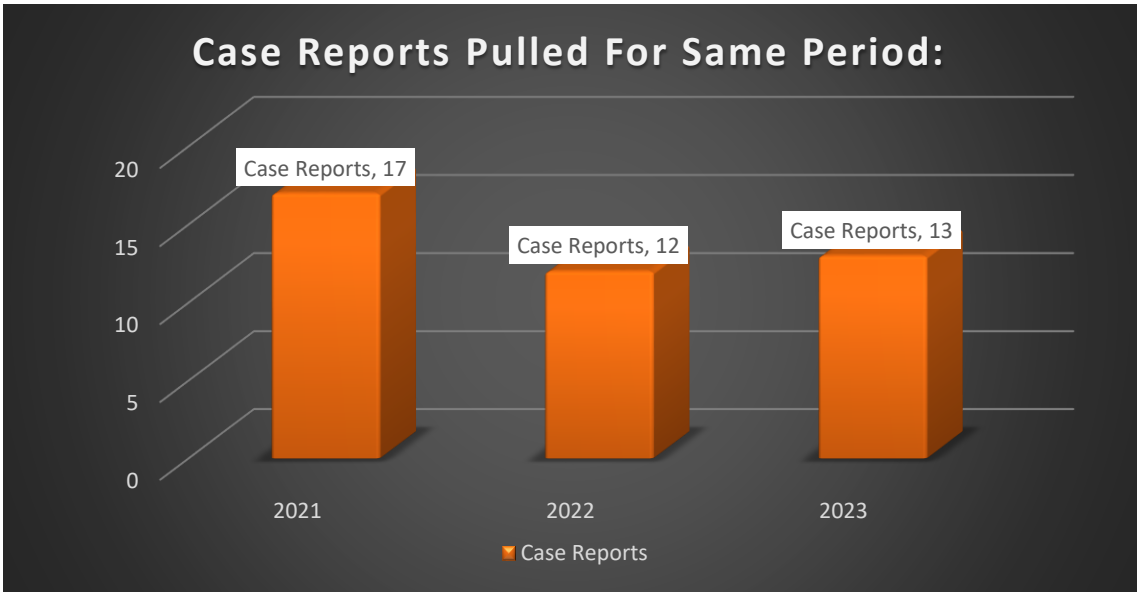




Elizabeth Police Department Activity Statistics Report

Reporting Period:

03/05/2023 to 03/18/2023



MAIN STREET BOARD OF DIRECTORS – RECORD OF PROCEEDINGS
FEBRUARY 13, 2023

CALL TO ORDER

The Regular Meeting of the Main Street Board of Directors was called to order on Monday, February 13, 2023, at 8:31 AM by Vice President Linda Bulmer.

ROLL CALL

Present were Vice President Linda Bulmer and Board Members Michael Hussey, Jeff Struthers, and Kurt Prinslow. President Tedd Lipka and Board Member Brandon Jeffress were not present. There was a quorum to conduct business.

Also present were Community Development Director Zach Higgins, Deputy Town Clerk Harmony Malakowski, and Community Development Administrative Assistant Dianna Hiatt.

AGENDA CHANGES

Mr. Higgins would like to add New Business item 5, discussion and possible action regarding the naming of the Friday night Farmer's Market.
No agenda changes from Board Members. Agenda set.

UNSCHEDULED PUBLIC COMMENT

There was no unscheduled public comment.

CONSENT AGENDA

1. Minutes of the Regular Meeting of January 9, 2023

   Motion by Mr. Hussey, seconded by Mr. Prinslow, to approve the minutes from January 9, 2023.

   The vote of those Board Members present was unanimously in favor. Motion carried.

NEW BUSINESS

2. Discussion and possible action regarding Town of Elizabeth Façade Grant Recommendation

   Motion by Mr. Hussey, seconded by Mr. Struthers, to recommend to the Board of Trustees creation of a Façade Grant program.

The vote of those Board Members present was unanimously in favor. Motion carried.

3. Discussion regarding Town of Elizabeth 5K Run

The Board would like to sponsor such an event and directed staff to revisit the topic again next month with more information.

4. Discussion regarding Gesin Lot Monument

The Board would like to revisit this item at next month's meeting after the developer presentation to the Board of Trustees on February 28, 2023.

5. Discussion and possible action regarding the renaming of the Friday Farmer's Market

Motion by Mr. Hussey, seconded by Mr. Struthers, to recommend to the Board of Trustees that the Friday Farmer's Market name be changed to either Beer with the Deer or Creek Nights.

The vote of those Board Members present was unanimously in favor. Motion carried.

STAFF REPORTS

- Mr. Higgins provided the Board with an update regarding the Streetscape Design. The Old Town Traffic Study will be provided to the Board at the February 14th meeting.
- There will be a presentation to the Board on February 28th regarding possible development on the Gesin lot.
- The ornament program was very successful. Only 9 ornaments remain in Town stock.
- Mr. Higgins reminded the Board about an upcoming water training on March 7, 2023.
- DOLA would like to set up a meeting for a Pickaxe branding session. This session would be to generate ideas and to update our Main Street branding.

BOARD REPORTS

- Mr. Hussey updated the Board regarding the conference that he attended last week.
- Vice President Bulmer was curious if there was an update regarding the Grant that was applied for.
- Vice President Bulmer provided an update regarding discussions with Main Street businesses having a booth at the Friday Night Farmer's Market.

ADJOURNMENT

Motion by Mr. Hussey, seconded by Mr. Prinslow, to adjourn the meeting at 10:05 AM.
The vote of those Board Members present was unanimously in favor. Motion carried.

President Tedd Lipka

Deputy Town Clerk Harmony Malakowski

TOWN OF ELIZABETH INCORPORATED SEAL SEPTEMBER 24 1890 ELBERT COUNTY COLORADO

PLANNING COMMISSION – RECORD OF PROCEEDINGS
MARCH 7, 2023

CALL TO ORDER
The Special Meeting of the Elizabeth Planning Commission was called to order on Tuesday, March 7, 2023, at 8:34 PM by Chair Jenny Case.

ROLL CALL
Present were Chair Jenny Case, Vice Chair Amy Schmidt, and Commissioners Julie Uhernik, Greg Lindbloom, George Fick, Rob Porter, and Ed Beard. There was a quorum to conduct business.

Also present were Town Administrator Patrick Davidson, Community Development Director Zach Higgins, Deputy Town Clerk Harmony Malakowski, Public Works Director Michael DeVol, Assistant Public Works Director James McErnie, and Community Development Administrative Assistant Dianna Hiatt.

AGENDA CHANGES
No agenda changes from staff.

No agenda changes by the Commissioners.

UNSCHEDULED PUBLIC COMMENT
No Unscheduled Public Comment.

CONSENT AGENDA
1. Minutes of the Regular Meeting of February 21, 2023

Motion by Commissioner Fick, seconded by Vice Chair Schmidt, to approve the Consent Agenda as presented.
The vote of those Commissioners present was unanimously in favor. Motion carried.

Chair Case closed the special meeting and opened the public hearing at 8:36 p.m.

PUBLIC HEARING
2. 701 S Elizabeth St – Pine Ridge Crossing Site Plan Amendment

Staff and the applicant provided an update and presentation to the Commissioners.

Public comments were made by the following individuals:
Rachel White – Town of Elizabeth resident
Roger Goodhue – Town of Elizabeth resident
Patsy Moore Weskamp – Unincorporated Elbert County resident
Paul Schwarzkopf – Town of Elizabeth resident

Chair case closed the Public Hearing and reopened the Special Meeting at 9:25 p.m.

NEW BUSINESS

3. Discussion and possible action on recommendation for approval regarding 701 S Elizabeth Street Pine Ridge Crossing Site Plan Amendment

Motion by Vice Chair Schmidt, seconded by Commissioner Fick, to recommend approval of the 701 S Elizabeth Street Pine Ridge Crossing Site Plan Amendment to the Board of Trustees.
The vote of those Commissioners present was unanimously in favor. Motion carried.

STAFF REPORT

- Mr. Higgins provided reminders and dates regarding upcoming training opportunities.
- Mr. Higgins provided an update to the Commissioners regarding the findings of Stolfus' Old Town Traffic Study.
- The Resolution for updating the Main Street Cross Sections has been tabled to get more information and to finalize plans.
- The Municipal Code updates that the Planning Commissioners worked through with the Board of Trustees went well and everyone is looking forward to finishing the discussions.
- Mr. Higgins provided a reminder to the Commissioners regarding guidelines for conveying information between Boards.
- A new Planner/Project Manager has been hired and will start next week.

COMMISSIONER REPORTS

- Commissioner Lindbloom and Vice Chair Schmidt felt the joint workshop with the Board of Trustees was productive and look forward to working with them again.

ADJOURNMENT

Motion by Vice Chair Schmidt, seconded by Commissioner Lindbloom, to adjourn the meeting at 9:46 p.m.
The vote of those Commissioners present was unanimously in favor. Motion carried.

Chair Jenny Case

Deputy Town Clerk Harmony Malakowski

TOWN OF ELIZABETH INCORPORATED SEAL SEPTEMBER 24 1890 ELBERT COUNTY COLORADO